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WILDLIFE REVIEW

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WILDLIFE REVIEW

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Except as indicated, abstracts are by William H. Stickel, editor.

WILDLIFE--NEW PROVINCIAL GAME JOURNAL

WILDLIFE REVIEW. Published semiannually by British Columbia Game Commission, 567 Burrard St., Vancouver 1, B. C. Vol. 1, no. 1, 14 p., illus., processed, Oct. 1954.

Popular journal that serves same purpose as most of our state game and fish magazines. First issue has brief articles on what game management is, lake fishing, changes in B. C. moose ranges and populations, predator control, estimated harvest of major game species in B. C. in 1953, and various news notes and quotations. Illustrations include photographs, cartoons, and drawings.

WILDLIFE--BIBLIOGRAPHY, BIOGRAPHY, HISTORY

Brandborg, Steward M., compiler. DIRECTORY OF ORGANIZATIONS AND OFFICIALS CONCERNED WITH THE PROTECTION OF WILDLIFE AND OTHER NATURAL RESOURCES. National Wildlife Federation (232 Carroll St., N. W., Wash. 12, D. C.) 1-52 p. Revised ed., July 1, 1954. 25¢.

This handy, low priced, annually revised booklet gives addresses of private and official conservation organizations in all American countries.

Johnson, Sam L. SCIENTISTS IN THE FISH AND WILDLIFE SERVICE - A CASE STUDY IN THE RECRUITMENT AND RETENTION OF FEDERAL SCIENTIFIC PERSONNEL. Master of Public Administration thesis, New York University. 149 p. 1954. (Copy in U.S.D.I. library.)

Kauffman, Erle. THE CONSERVATION YEARBOOK, 1954. The Conservation Yearbook, 1740 K St., N. W., Wash. 6, D. C. 320 p. 1954. $6.00. [From review by Henry Clepper, Journal of Forestry 52 (9).]

New edition of what is, among other things, a valuable guide to conservation organizations and their officials. "If any pertinent or useful information has been omitted, truly this reviewer does not know what it could be. It is all here--data on forests, soil, water, parks, wildlife, and range; the executives and technicians in charge; the location and acreage involved--in short, the where, the who, and the what of conservation."

Levi, Herbert W. (Dept. Zool., U. Wis.) BIBLIOGRAPHY ON THE INTRODUCTION OF EXOTIC ANIMALS (REVISED 1954). 1-9 p., mimeo. Fall 1954.

This valuable bibliography has introduction by H. H. Shoemaker. Enclosed with the bibliography is a sheet that points up strongly the dangers of current introductions of "San Juan rabbits" into continental U. S.

Mann, Roberts. ALDO LEOPOLD, PRIEST AND PROPHET. American Forests 60 (8): 23, 42-43, illus. Aug. 1954.

Marshall, George. BIBLIOGRAPHY OF ROBERT MARSHALL: A SUPPLEMENT. Living Wilderness 19 (49): 31-35, illus. Summer 1954.

The main bibliography of this great advocate of wilderness was published in the Autumn 1951 issue of The Living Wilderness.

McAtee, W. L. (3 Davie Circle, Chapel Hill, N. C.) ELLIOTT COUES. Nature Magazine 47 (8): 431-432, portrait. Oct. 1954.

Brief account of life and work of one of the greatest naturalists of the last century. He was primarily an ornithologist, but boundless energy led him into several other fields.

McAtee, W. L. (3 Davie Circle, Chapel Hill, N. C.) THOMAS NUTTALL. Nature Magazine 47 (10): 541-542, 550, portrait. Dec. 1954.

Good account of life of this famous botanist, ornithologist, naturalist, and explorer.

WILDLIFE--EDUCATION

Beach, Grace O. (Izaak Walton League Am., Chicago.) CONSERVATION FACTS NEEDED BY WOMEN. Trans. 19th N. Amer. Wildl. Conf. p. 562-566. 1954.
Many women's groups are interested and active in conservation but they can get little help from numerous agencies that should supply it. Some of the things that should be done for them or made available to them are: 1. Kit program material. 2. Aid in selecting subjects and background material for discussion. 3. Suggest or supply suitable speakers. 4. Suggest or supply worthwhile films. 5. Provide printed material for distribution or tell where to get it. 6. Help plan programs and projects. 7. Conduct school for club women, as now done in at least 3 states.

Hargraves, Malcolm M. (Mayo Clinic, Rochester, Minn.) BETTER GUIDES FOR CONSERVATION EFFORTS OF SPORTSMEN. Trans. 19th N. Amer. Wildl. Conf. p. 566-572. 1954.
Stresses the indispensability of getting reliable facts to sportsmen and amplifies on the following points concerning methods: 1. A Cooperative Interstate (National) Publication for wide distribution and dedicated to conservation education of the public would have high value. 2. Educational program should be kept interesting and simple. Make a point of reaching children as well as adults. 3. Children's books like those of Eschmeyer are proving highly useful. 4. Enlist community leaders to back program; the SCS "natural leader" system. 5. Conservation Education Workshop and Amateur Game Managers Shortcourse both have been great boons. 6. "Interpretation of technical literature for the layman may best be done by a layman with the advice of the trained scientist." 7. Work with the educators. 8. "The outdoor writers exert a tremendous influence on the thinking and education of the sportsman. From a conservation education standpoint these writers present a problem which I will not venture to discuss--rather, I would recommend a little soul searching collectively and individually after pointing out the enormity of their responsibility."

Huddleston, Kenneth E. (Farm Equipment Inst., Chicago.) INDUSTRIAL INTERESTS IN CONSERVATION. Trans. 19th N. Amer. Wildl. Conf. p. 547-553. 1954.
Explains the interest industry has in conservation, stresses the need for carrying the attitude of conservation education into every public contact a conservation agency has, and makes the stimulating suggestion that conservation agencies could accomplish much more if they had committees of business men to advise on and actively help with educational programs.

Kabat, Cyril, and Ruth L. Hine. (Wis. Cons. Dept.) OPERATION WILDLIFE RESEARCH. Wisconsin Conservation Department, Wisconsin Wildlife no 2. 1-35 p., illus. 1954.
An attractive popular booklet that explains the whys and whats of wildlife research projects in Wis. Question and answer format is employed. Answers are given in considerable detail and results of research are mentioned frequently.

Keefe, Jim. (Mo. Cons. Comm.) BUTEO'S FOREST. Missouri Conservation Commission. 1-29 p., illus. 1954.
An educational story for children. It is written at 5th grade level and has numerous drawings by Jim Keller. The booklet uses the story of a red-tailed hawk to convey some idea of the life and ecology of woods and fields. It also tells of the cause, course, and effects of a forest fire that the hawk encountered.

Taylor, Lytton. (St. Paul Dispatch, Minn.) A FACTUAL PRESS RESULTS IN A CONSERVATION-MINDED PUBLIC. Trans. 19th N. Amer. Wildl. Conf. p. 555-559. 1954.
Hits at the lack or inadequacy of information services in state and federal wildlife agencies. The author feels that "handouts" or news releases are far from satisfactory media. Agencies should have information services staffed with well trained personnel who know what is newsworthy, who would get news to the press, and who would be paid salaries high enough to keep them in their positions. "I think that information services are the most neglected, yet

WILDLIFE--EDUCATION--Continued

potentially one of the most important phases of wildlife management. ...where there is no information service...funds should be juggled so as to permit creation of such service." The author does not say how this can be done while Congress and legislatures are actively opposed to what they regard as propaganda units.

WILDLIFE--TECHNIQUES

Fisher, H. D., and B. A. Mackenzie. (Atlantic Biol. Sta., St. Andrews, N. B.) RAPID PREPARATION OF TOOTH SECTIONS FOR AGE DETERMINATIONS. Journal of Wildlife Management 18 (4): 535-537, illus. Oct. 1954.

Tooth sections of harp seal had to be made thin enough for age determinations by transmitted light. Equipment is described and illustrated: a power-driven jeweler's saw, and a complicated power grinder. A tooth must be kept moist until sectioned. A section about ½ mm. thick is cut and then ground down to a thickness of 100 microns. The whole process can be done within a minute; large series can be handled rapidly. Sections as thin as 25 microns can be prepared if desired.

Robinette, W. Leslie, Dale A. Jones, Jay G. Gashwiler, and C. M. Aldous. (US F&WS, Salt Lake City.) METHODS FOR CENSUSING WINTER-LOST DEER. Trans. 19th N. Amer. Wildl. Conf. p. 511-524. 1954.

An experimental analysis of strip census methods. Should be of importance to all using such methods for estimating numbers of living or dead animals. Authors' summary: "The writers have tested five census methods (King's grouse census method, Lincoln Index, Kelker's belt transect method, Webb's snowshoe hare census method and Hayne's modification of King's method) by comparing population estimates derived from each with a known population of dead deer and of burlap sacks. From the results the writers have concluded that Kelker's, King's and the Lincoln Index methods can be expected to give reliable results with adequate sampling and certain sampling precautions. Webb's and Hayne's methods, however, gave results significantly in excess of known population, indicating neither is adapted to the censusing of inanimate objects. Of the five methods tested the writers favor King's for censusing dead deer for various reasons given in the text."

Sealander, John A., and Robert G. Leonard. (U. Ark.) USE OF CRAYFISH FOR CLEANING SKELETAL MATERIAL. Journal of Mammalogy 35 (3): 428-429. Aug. 1954.

WILDLIFE--BIOMETRICS Dr. Vincent Schultz has searched through the journals listed immediately below for papers that appeared to be of direct value to wildlife research workers. Articles of strictly statistical nature were excluded. The selected titles are entered in this section. Journals searched were:

Sankhyā (The Indian Journal of Statistics).
Vols. 1-13. [No pertinent entries found.]
Journal of the Royal Statistical Society.
Vols. 1-117 and Supplements vols. 1-15.
Journal of the American Statistical Association.
Vols. 1-49 (266).

Anderson, Edgar. (Mo. Botanical Garden.) EFFICIENT AND INEFFICIENT METHODS OF MEASURING SPECIFIC DIFFERENCES. p. 93-106 in Kempthorne et al., which see.

"It is demonstrated that species do not differ at random, that species are differentiated by combinations of characters more certainly than by single characters, that trends in proportion are more characteristic of species differences than changes in proportion and much more than are differences in absolute size. The method of pictorialized scatter diagrams is presented as a rough but efficient means of dealing with multiple-sense-impression problems."--V. Schultz.

WILDLIFE--BIOMETRICS--Continued

Anderson, R. L., and T. A. Bancroft. STATISTICAL THEORY IN RESEARCH. I. BASIC STATISTICAL THEORY. II. ANALYSIS OF EXPERIMENTAL MODELS BY LEAST SQUARES. McGraw-Hill Book Co., N. Y. xix + 388 p., illus. 1952. $7.00. [From review by Irwin Bross, Quarterly Review of Biology 29 (1).]
To judge from Bross's review, this book is intended to help research workers apply suitable statistical methods to experimental results for which standard techniques such as analysis of variance are not fitted. For those with considerable statistical background.

Bell, W. B. METHODS IN WILDLIFE CENSUSES. Journal of the American Statistical Association 32 (199): 537-542. Sept. 1937.
Very general.--V. Schultz.

Birnbaum, Allan. SOME PROCEDURES FOR COMPARING POISSON PROCESSES OR POPULATIONS. Biometrika 40: 447-449. 1953. [From review by C. H. Blake, Bird-Banding 25 (3).]

Buckland, W. R. A REVIEW OF THE LITERATURE OF SYSTEMATIC SAMPLING. Journal of the Royal Statistical Society (Supplement) 13 (2): 208-215. 1951.--V. Schultz.

Chaing, Chin Long. (U. Calif., Berkeley.) COMPETITION AND OTHER INTERACTIONS BETWEEN SPECIES. p. 197-215 in Kempthorne et al., which see.
"The main problem considered in this paper is the growth of mixed populations under different types of interactions."--V. Schultz.

Clark, Philip J., and Francis C. Evans. (U. Mich.) DISTANCE TO NEAREST NEIGHBOR AS A MEASURE OF SPATIAL RELATIONSHIPS IN POPULATIONS. Ecology 35 (4): 445-453. Oct. 1954.
A simple statistical method is proposed and examples are given from studies of plant populations.

Clausen, J. A., and R. N. Ford. CONTROLLING BIAS IN MAIL QUESTIONNAIRES. Journal of the American Statistical Association 42 (240): 497-511. Dec. 1941.--V. Schultz.

Cochran, W. G. ANALYSIS OF VARIANCE FOR PERCENTAGES BASED ON UNEQUAL NUMBERS. Journal of the American Statistical Association 38 (223): 287-301. Sept. 1943.--V. Schultz.

Cochran, W. G., F. Mosteller and J. W. Tukey. (School of Hygiene, Johns Hopkins U.) PRINCIPLES OF SAMPLING. Journal of the American Statistical Association 49 (265): 13-35. March 1954.
Should be read by every wildlife worker interested in sampling or in interpreting results of those who employed sampling methods.--V. Schultz.

Cowden, D. J. SIMPLIFIED METHODS OF FITTING CERTAIN TYPES OF GROWTH CURVES. Journal of the American Statistical Association 42 (240): 585-590. Dec. 1947.--V. Schultz.

Cox, D. R. SOME SIMPLE APPROXIMATE TESTS FOR POISSON VARIATES. Biometrika 40: 354-360. 1953. [From review by C. H. Blake, Bird-Banding 25 (3).]

Crow, J. F. (U. Wis.) BREEDING STRUCTURE OF POPULATIONS. II. EFFECTIVE POPULATION NUMBER. p. 543-556 in Kempthorne et al., which see.--V. Schultz.

Day, B. B., and M. M. Sandomire. USE OF THE DISCRIMINANT FUNCTION FOR MORE THAN TWO GROUPS. Journal of the American Statistical Association 37 (220): 461-472. Dec. 1942.
"...concerned with the application of the discriminant function to estimating age class of deer." A statistical paper utilizing deer data from the Alleghany National Forest in Pa. Technique has uses in taxonomic studies.--V. Schultz.

WILDLIFE--BIOMETRICS--Continued

DeLury, D. B. (Ontario Research Foundation, Toronto 5.) ON THE ASSUMPTIONS UNDERLYING ESTIMATES OF MOBILE POPULATIONS. p. 287-293 in Kempthorne et al., which see.--V. Schultz.

Dixon, W. J. PROCESSING DATA FOR OUTLIERS. Biometrics 9: 74-89. 1953. [From review by C. H. Blake, Bird-Banding 25 (3).]
"Definite rules are given for eliminating items of data which either represent rather gross errors or are not part of the series under consideration."

Gevorkiantz, S. R. (Lake States Forest Expt. Sta., St. Paul 1, Minn.) PROBLEMS IN FOREST INVENTORY FROM THE FORESTER'S POINT OF VIEW. p. 251-262 in Kempthorne et al., which see.--V. Schultz.

Good, I. J. THE POPULATION FREQUENCIES OF SPECIES AND THE ESTIMATION OF POPULATION PARAMETERS. Biometrika 40: 237-264. 1953. [From review by C. H. Blake, Bird-Banding 25 (3).]
"A random sample is drawn from an infinite (= extremely large) population and, in practice, containing a large but finite number of species. This sample tells how many species are represented by one individual each or by two individuals, and so on. It is then possible to estimate the proportion (frequency) of each species in the population, the proportion made up of all the species occurring in the sample, and the so-called heterogeneity of the population. Under certain conditions the number of species in the population not represented in the sample may be estimated. No estimate of total population size is derived nor can one be derived. The method is applicable to rather large samples of ducks, shorebirds, or warblers taken over (say) an entire migration. If a satisfactory estimate of population size for one species is available, the total population can be estimated. An interesting bibliography is given. See also Bird-Banding, 23:78, review No. 11."

Goodman, L. A. POPULATION GROWTH OF THE SEXES. Biometrics 9: 212-225. 1953. [From review by C. H. Blake, Bird-Banding 25 (3).]
"The author considers theoretically what may happen to a population depending on differences in the production and survival of the two sexes. Several mathematical models are used."

Griffith, A. L., and Bakshi Sant Ram. THE SILVICULTURE RESEARCH CODE. Vol. 2. THE STATISTICAL MANUAL. Geodetic Branch, Survey of India, Dehra Dun. viii + 214 p. 1947. 17s. 6d. plus postage. Order from Publications Branch, India House, Aldwych, London W.C. 2, Eng.
To the reviewer's knowledge, this book is the only one of its type. Its subject matter is quite different from that of Schumacher and Chapman (Sampling Methods in Forestry and Range Management. Duke U. School Forestry, Bul. 7, revised 1948.). To quote the authors, "The statistical methods...presented include the latest developments in experimental technique. ...the subject has been divided into three parts. Part I deals with the general elementary principles, Part II with the experimental designs and the classification of common silvicultural experiments, and Part III has been devoted to typical solved examples illustrating the most important methods generally applicable to silvicultural investigations." A split plot design for investigation of effect of deer on natural regeneration of forests under various cutting procedures is presented on p. 186.--Vincent Schultz. (Reviewer is willing to lend his copy. Present address: Dept. Biostatistics, 615 N. Wolfe St., Baltimore 5, Md.)

Griffith, A. L., and Jagdamba Prasad. THE SILVICULTURE RESEARCH CODE. Vol. 3. THE TREE AND CROP MEASUREMENT MANUAL. Publisher and source as above. viii + 229 p. 1949. 21s. plus postage.
A companion volume to vol. 2. Should be of interest to persons concerned with suitable ecological research techniques.--Vincent Schultz. (Reviewer is willing to lend his copy. Address above.)

WILDLIFE—BIOMETRICS--Continued

Hasel, A. A. (U. S. Forest Ser.) PROBLEMS IN FOREST INVENTORY: FROM THE STATISTICAL POINT OF VIEW. p. 263-272 in Kempthorne et al., which see.--V. Schultz.

Hotelling, H. DIFFERENTIAL EQUATIONS SUBJECT TO ERROR AND POPULATION ESTIMATES. Journal of the American Statistical Association 22 (New series, no. 159): 283-314. Sept. 1927.--V. Schultz.

Isaacson, S. L. (Iowa St. Coll.) PROBLEMS IN CLASSIFYING POPULATIONS. p. 107-117 in Kempthorne et al., which see.--V. Schultz.

Jessen, R. J. (Iowa St. Coll.) GENERAL METHODOLOGY IN SAMPLING HUMAN POPULATIONS. p. 229-249 in Kempthorne et al., which see.--V. Schultz.

Kempthorne, Oscar, Theodore A. Bancroft, John W. Gowen, and Jay L. Lush (editors). STATISTICS AND MATHEMATICS IN BIOLOGY. Iowa State College Press. ix + 632 p. 1954. $6.75.
Selected papers of the Biostatistics Conference held at Iowa State College, June and July, 1952. First section deals with general biometric principles and procedures, the second with changes in population number, the third with estimation of populations, the fourth with determination of biological response, and the fifth with genetical analysis of populations. Certain component papers of interest to wildlife workers are listed by author in this section of WR, with citation given only as "Kempthorne et al." Reprints of some of these papers are available from authors.--Vincent Schultz.

Kendall, D. G. STOCHASTIC PROCESSES AND POPULATION GROWTH. Journal of the Royal Statistical Society (Supplement) 11 (2): 230-264. 1949.--V. Schultz.

Lush, J. L. (Iowa St. Coll.) BREEDING STRUCTURE OF POPULATIONS. I. GENERAL CONSIDERATIONS. p. 537-541 in Kempthorne et al., which see.--V. Schultz.

McChesney, R. THE GRAPHICAL CONSTRUCTION OF MOVING AVERAGES. Journal of the American Statistical Association 23 (New series, no.162): 164-172. June 1928.--V. Schultz.

Monroe, John. (Univ. N. C.) THE NIOBRARA BASIN RECREATION STUDY. Report by the Iowa State College Statistical Laboratory to the U. S. National Park Service, Region 2. Approximately 113 unnumbered pages, typed and multilithed. 1953(?). NOT AVAILABLE FOR DISTRIBUTION.
Objective of this survey conducted in 1952 was "the preparation of a comprehensive plan and report to serve as a guide for the preservation, use and development of all non-urban, outdoor recreation resources in that basin." This report contains a comprehensive discussion of the survey procedure and a limited amount of information on the hunting and fishing activities of persons residing on the study area.--V. Schultz.

Mosteller, F. and J. W. Tukey. THE USES AND USEFULNESS OF BINOMIAL PROBABILITY PAPER. Journal of the American Statistical Association 44 (246): 174-212. June 1949.--V. Schultz.

Mottley, C. McC. THE EFFECT OF THE FULL MOON ON TROUT FISHING. Journal of the American Statistical Association 37 (217): 41-47. March 1942.
Technique has applications to game problems.--V. Schultz.

Nair, K. R. (Forest Research Inst., Dehra Dun, India.) THE FITTING OF GROWTH CURVES. p. 119-132 in Kempthorne et al., which see.
Describes eight methods of fitting the logistic curve to population data.--V. Schultz.

Osborne, J. G. SAMPLING ERRORS OF SYSTEMATIC AND RANDOM SURVEYS OF COVER-TYPE AREAS. Journal of the American Statistical Association 37 (218): 257-264. June 1942.--V. Schultz.

WILDLIFE--BIOMETRICS--Continued

Park, Thomas. (U. Chicago.) COMPETITION: AN EXPERIMENTAL AND STATISTICAL STUDY. p. 175-195 in Kempthorne et al., which see.--V. Schultz.

Proudfoot, M. J. SAMPLING WITH TRANSVERSE TRAVERSE LINES. Journal of the American Statistical Association 37 (218): 265-270. June 1942.--V. Schultz.

Reed, L. J., and R. Pearl. ON THE SUMMATION OF LOGISTIC CURVES. Journal of the Royal Statistical Society 90 (pt. 4): 729-746. 1927.--V. Schultz.

Scattergood, L. W. (US F&WS, Boothbay Harbor, Me.) ESTIMATING FISH AND WILDLIFE POPULATIONS: A SURVEY OF METHODS. p. 273-285 in Kempthorne et al., which see.
Excellent discussion and bibliography on this subject.--V. Schultz. [References not cited in reprint.]

Spurr, W. A., and D. R. Arnold. A SHORT-CUT METHOD OF FITTING A LOGISTIC CURVE. Journal of the American Statistical Association 43 (241): 127-134. March 1948.--V. Schultz.

Thompson, H. R. (Applied Math. Lab., DSIR, Wellington, N. Z.) A NOTE ON CONTAGIOUS DISTRIBUTIONS. Biometrika 41 (1 & 2): 268-271. June 1954.
A note on contagious distributions in regard to plant ecological problems.--V. Schultz.

Wadley, F. M. AN APPLICATION OF THE POISSON SERIES TO SOME PROBLEMS OF ENUMERATIONS. Journal of the American Statistical Association 40 (229): 85-92. March 1945.--V. Schultz.

Wilm, H. G. THE DESIGN AND ANALYSIS OF METHODS FOR SAMPLING MICROCLIMATIC FACTORS. Journal of the American Statistical Association 41 (234): 221-232. June 1946.--V. Schultz.

Woodruff, R. S. CONFIDENCE LIMITS FOR MEDIANS AND OTHER POSITION MEASURES. Journal of the American Statistical Association 47 (260): 635-646. Dec. 1952.--V. Schultz.

Yule, G. U. THE GROWTH OF POPULATION AND FACTORS WHICH CONTROL IT. Journal of the Royal Statistical Society 88 (pt. 1): 1-62. Jan. 1925.--V. Schultz.

WILDLIFE--ECONOMIC AND OTHER VALUES

Anonymous. BIG BUSINESS. Sport Fishing Institute Bulletin no. 34. p. 3. Sept. 1954.
"Paragraphs from a recent New Hampshire fish and game department release:
Sportsmen spent $22,000,000 in New Hampshire in 1952. This figure, derived from an economic survey conducted in 1953 by the Management and Research Division of the New Hampshire Fish and Game Department, is rock-bottom. Further study of the information obtained from the study may show that hunting and fishing brought in even more than the preliminary breakdown indicates.
Of this figure, $13,000,000 was spent by fishermen alone. Not included in the survey is revenue received from the sale of fishing and hunting licenses, which amounted to $852,320.75 in that year.
'In comparison, only $6,000,000 was spent eighteen years ago on fishing and hunting in New Hampshire,' says game biologist Dave White." Copied completely.

Anonymous. BIG BUSINESS. Sport Fishing Institute Bulletin no. 35, p. 5. Oct. 1954.
According to a Minnesota department of conservation press release, the 1,245,055 sportsmen who purchased game and fish licenses in the state in 1953 spent more than $277,000,000 in pursuit of their sport. Fishing accounted for nearly $200,000,000 of this amount. The average amount spent by anglers was $209.83.

WILDLIFE--ECONOMIC AND OTHER VALUES--Continued

Expenditures for goods which ordinarily would be used for several years was $80 to $90 for fishermen. The balance was for meals, lodging, transportation, club dues, licenses and cost of maintaining equipment. It was found that 44 percent of the hunter's dollar is spent for firearms; 58 percent of the fisherman's dollar is spent for boats and motors."

Anonymous. WILDLIFE RESOURCES SURVEY. Idaho Wildlife Review 7 (1): 5. July-Aug. 1954.
"A wildlife resources survey conducted by Willis C. Royall, Jr., showed that resident and non-resident license holders spent an estimated $43,300,000 in Idaho hunting and fishing during 1953." Details are given on these expenditures. Per capita costs to residents and non-residents are listed for different types of hunting and fishing.

Couture, Lawrence H. (311 Glendale Rd., N. Wilbraham, Mass.) SEVENTY-FOUR MILLION DOLLARS A YEAR JUST FOR THE FUN OF IT. Massachusetts Division of Fisheries & Game, Bulletin 14. 1-11 p., illus. June 1954.
Statistically controlled study of sportsmen's expenditures. "Massachusetts has become one of the first states to take the guesswork out of how much its hunters and fishermen pay for their sport in a single year, and the answer runs well into eight figures--$56,166,662 to be exact. Added to this amount which is spent for inland fishing and hunting is a conservative estimate of $18,000,000 for salt water fishing, bringing the grand total to about $74,000,000." Financial break-down by items is given. Fish and game species are listed according to percentages of sportsmen who prefer them. A supplement, "How It Was Done," by Sargent Russell and L. H. Couture, explains the statistical basis of the survey and makes recommendations about methods. The supplement is available from Coop. Wildl. Res. Unit, U. of Mass., Amherst.

WILDLIFE--FOODS

Campbell, Robert S., and others. NUTRITIVE VALUES OF NATIVE PLANTS ON FOREST RANGE IN CENTRAL LOUISIANA. Louisiana State University and Agricultural and Mechanical College Agricultural Experiment Station, Louisiana Bulletin no. 488. 1-18 p., illus. May 1954.
Should be of value in southern wildlife work. "This bulletin is the first publication of detailed chemical analyses of range forage plants in Louisiana. It evaluates the important range forage species at different stages of growth; considers the effects of such factors as timber type, burning, grazing, and fertilizing on nutrient content; points out the deficiencies in actual cattle diet at various times of the year; and suggests ways of meeting these deficiencies."

Martin, Alexander C. (Patuxent Refuge, Laurel, Md.) IDENTIFYING POLYGONUM SEEDS. Journal of Wildlife Management 18 (4): 514-520, illus. Oct. 1954.
Key to and illustrations of seeds of 22 American species of smartweeds that are especially common or important to wildlife. Good drawings show whole seeds and cross sections.

WILDLIFE--NATURAL AREAS AND REFUGES

Anonymous. CHECK LIST OF CRITERIA FOR SELECTING NATURAL AREAS FOR NATURE RESERVES. The Nature Conservancy (4200 22nd St. N.E., Wash. 18, D. C.), Information Bulletin 5. 1 p. Feb. 1953.
Lists some 30 points to be considered. These points pertain to degree of naturalness, future permanence, economic value, suitability of location, size, special values.

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

Anonymous. HOW YOU CAN HELP WITH NATURE PRESERVATION ACTIVITIES. The Nature Conservancy (4200 22nd St. N.E., Wash. 18, D.C.), Information Bulletin 7. 5 p. May 1954.
Gives much practical information on organization and leadership for preservation of natural areas.

Anonymous. THE TRUSTEES OF RESERVATIONS. The Nature Conservancy (4200 22nd St. N.E., Wash. 18, D.C.), Information Bulletin 8. 4 p. July 1954.
The Trustees of Reservations is a private non-profit Mass. corporation that for 60 years has been carrying out in its state a program whose objectives are very similar to those of the Nature Conservancy. This Bulletin discusses legal status, problems, and practical experience of the group. The group is careful not to duplicate the work of other agencies such as the state department of conservation. It has found that maintenance of buildings presents an overwhelming financial problem. Preserved areas are open to the public, but under regulation, and fees for entry may be charged. These fees help with maintenance costs, but it is now policy to seek endowment funds for each area as it is acquired. The group now owns and administers 26 areas and has a membership of 1300.

Anonymous. PROPERTY TAX EXEMPTION LAWS. The Nature Conservancy (4200 22nd St. N.E., Wash. 18, D.C.), Information Bulletin 9. 21 p. July 1954.
Good review of tax situation as it relates to nature preserves and legally similar areas. Variations between states are emphasized. The introduction gives some wise and practical advice on how to go about getting tax exemption for natural areas.

Butcher, Devereux. (Nat. Parks Assn., Wash. 7, D. C.) EXPLORING OUR NATIONAL PARKS AND MONUMENTS. Houghton Mifflin Co., Boston. 288 p., illus. 4th ed. 1954. Cloth, $4.50; paper, $2.50. [From review by A. B. Meyer, American Forests 60 (10).]
Beautifully illustrated with 26 color photos and 280 black-and-white photos. The text tells primarily "about the physical aspects of the areas: where they are, how big they are, when they were established, their major features, season of operation, what lodging facilities are available... For each area the author describes the geologic, scenic, vegetative or other main feature that makes the area unique, plus varying amounts of additional information such as what species of wildlife might be encountered and pertinent historical events." This part is "followed by a brief resume of other nature reservations in the country--state parks, national forest wilderness areas, and national wildlife refuges." A brief but informative history, "The American Indian," by Dr. Frank H. H. Roberts of the Bureau of American Ethnology, lends considerable significance to the section dealing with national archeological monuments.

Coupland, R. T. (U. Saskatchewan, Saskatoon.) THE ROLE OF NATURAL GRASSLAND AREAS IN RESEARCH. Addresses and Proceedings of Farm Week, University of Saskatchewan, 1954. p. 3-7. 1954.
History of grassland reservation in Sask., importance of grassland preserves for research in several fields, plans for management of and research on the grassland reserves in Sask.

Darling, Jay N. THE STORY OF THE WILDLIFE REFUGE PROGRAM. PART II. National Parks Magazine 28 (117): 53-56, 86-91, illus. with author's cartoons. April-June 1954.
Darling writes his footnotes to history frankly and bluntly; he punctures some great reputations. In the first of this 2-part series, he told how money to start the refuge program finally was obtained. The second part tells what went on before the money was obtained. In the early 1930's the president appointed a special 3-man duck committee, of which the author was a member. Members disagreed violently until a man in N. D. suggested restoring ruined duck marshes. This idea was publicized and suggestions for good areas poured in from

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

all over the country. Pressure for action was intense. Much of the work could have been done by relief agencies, but some money was necessary. Darling was made chief of the Biological Survey and given orders to get the program under way. But he was given no money. He was given all sorts of encouragement; money would be available from any of several funds--but it never was. Finally he found he was being given a deliberate run-around--that he was the victim of an elaborate hoax--that there was no intention of providing money or land for ducks. There would have been no hope for refuges had not Sen. Norbeck succeeded in the stratagem described in Part I. But with the $6 million won by Norbeck the refuge program began rolling rapidly.

Gilligan, James P. (U. Mich.) WILDLIFE VALUES IN WESTERN WILDERNESS AREA MANAGEMENT. Journal of Wildlife Management 18 (4): 425-432. Oct. 1954.

Important discussion of the invasion and gnawing away of wilderness areas for the sake of timber harvest, fire protection, mining, road building, fishing, and big game harvesting. The situation is highly complex and appears to demand sacrifices by all interests. Big game herds in wilderness areas tend to grow too large and injure their range, thus damaging vital watershed values. It is almost impossible to get enough hunters to go far enough into wilderness areas to control herds. Hence there is increasing pressure for more access roads, landing fields, and other facilities. "State officials, individuals, and sportsmen groups that urge wilderness preservation and also support the principle of maximum game populations have a greater responsibility than increasing hunter benefits. They are obligated to make a larger collective effort to assist in harvesting game overpopulations in remote areas by primitive means." "Perhaps the states as title holders of big game animals hold the key to preservation of federal wilderness areas. Encouragement of primitive methods of game harvest through special inducements such as reduced out-of-state licenses, special-rate transportation or extra game bonuses is within the states' power." "Such efforts would provide the test of whether they really want large wilderness areas. Present indications are that they do not."

Jones, Ralph A. NATURE PROTECTION BEHIND THE IRON CURTAIN. National Parks Magazine 28 (118): 116-123, map. July-Sept. 1954.

"In 1951, the USSR apparently reduced the number of its 'national parks' from 118 to forty, and their total area from 30,887,500 acres to 3,621,665 acres, or less than one eighth of their former area." This change is discussed on the basis of Russian publications. Locations of the remaining 40 are mapped, and 28 of the 40 are characterized as to size, nature, and purpose. In size these 28 preserves range from 9,981 acres to 480,929 acres. The areas are said to be maintained for scientific rather than recreational purposes. Some seem to be primarily for wildlife or natural area preservation.

Shanklin, John F. (Committee chairman, Soc. Am. Foresters.) OPPORTUNITIES FOR RESEARCH IN NATURAL AREAS. Journal of Forestry 52 (9): 706-707. Sept. 1954.

Lists forest-related studies being made in natural areas in many countries. The variety of projects is of considerable interest. Natural areas of the U. S. are not yet receiving the research use for which they are truly adapted. [Promotion of such use should aid in getting more natural areas approved and established.]

U. S. Fish & Wildlife Service. REFUGE LEAFLETS.

Three series of these leaflets are being issued for use of visitors to refuges. Note that the general series begins with no. 1, bird list series with no. 101, and historical series with 201. Further numbers in these series are expected to appear.

General Series.--An issue provides general information about a refuge and has a simple map and sketches. Numbers vary in length and format. Some are printed, some processed.

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

RL	1.	Visiting National Wildlife Refuges		1953	8 p.	10¢
	2.	Bear River	Utah	1952	2 p.	-
	3.	Mattamuskeet	N. C.	1952	2 p.	-
	4.	Wichita Mountains	Okla.	1953	4 p.	5¢
	4A.	Wichita Mountains	Okla.	1954	Folder	-
	5.	Cape Romain	S. C.	1953	4 p.	5¢
	6.	Pea Island	N. C.	n.d.	4 p.	5¢
	7.	Wheeler	Ala.	1954	4 p.	-
	8.	Okefenokee	Ga.	1954	4 p.	5¢
	9.	Crab Orchard	Ill.	In prep.	Folder	-

Bird List Series.--Each number of this series has a little information about the refuge and contains a list of its birds, with indications of seasonal occurrence and relative abundance. Each has 3-4 pages. Processed.

RL	101.	Cape Romain	S. C.	No date
	102.	Stillwater	Nev.	No date
	103.	White River	Ark.	No date
	104.	Klamath Basin	Ore.-Calif.	1954
	105.	Sand Lake	S. D.	"
	106.	Bowdoin	Mont.	"
	107.	Mattamuskeet & Swanquarter	N. C.	"
	108.	Kentucky Woodlands	Ky.	"
	109.	Wichita Mountains	Okla.	"
	110.	Crab Orchard	Ill.	"
	111.	Mud Lake	Minn.	"
	112.	Havasu Lake	Ariz.-Calif.	"
	113.	Pea Island	N. C.	"
	114.	Sheldon	Nev.	"
	115.	Arrowwood	N. D.	"
	116.	Bitter Lake	N. M.	"
	117.	Salt Plains	Okla.	"
	118.	Seney	Mich.	"
	119.	Waubay	S. D.	"
	120.	Santee	S. C.	"
	121.	Hagerman & Tishomingo	Texas-Okla.	"
	122.	San Andres	N. M.	"
	123.	Souris Loop	N. D.	"
	124.	Santa Ana	Texas	"
	125.	Laguna Atascosa	Texas	"
	126.	Aransas	Texas	"
	127.	Chautauqua	Ill.	"
	128.	Chincoteague	Va.	"
	129.	Piedmont	Ga.	"
	130.	St. Marks	Fla.	"
	131.	Bombay Hook	Del.	"
	132.	Desert Game Range	Nev.	"
	133.	Horicon	Wis.	"
	134.	Bosque del Apache	N. M.	"
	135.	Reelfoot & Lake Isom	Tenn.	"
	136.	Montezuma	N. Y.	"

Historical Series.

RL 201. History of St. Marks National Wildlife Refuge. 2 p. Processed. 1954.

WILDLIFE--NATURAL AREAS AND REFUGES--Continued

Various authors. CALIFORNIA'S NATIONAL FOREST WILDERNESS. Living Wilderness 19 (49): 15-29, maps. Summer 1954.
California has 18 of the nation's 79 officially designated wilderness areas, more than any other state. Each of these 18 areas is here mapped and described.

Zahniser, Howard. (Wilderness Soc., Wash., D. C.) THE PLACE OF PARKS AND RECREATION IN OUR NEW PROGRAMS FOR WATERSHED CONSERVATION. Trans. 19th N. Amer. Wildl. Conf. p. 63-69. 1954.
Stresses the values of wild areas and recreational areas in this increasingly artificial civilization, and expresses the hope that parks and natural areas can be incorporated in plans for small watershed management.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Kelly, C. F., T. E. Bond, and Hubert Heitman, Jr. (U. Calif. at Davis.) THE ROLE OF THERMAL RADIATION IN ANIMAL ECOLOGY. Ecology 35 (4): 562-569, illus. Oct. 1954.

Thorpe, W. H. (Cambridge U., England.) SOME CONCEPTS OF ETHOLOGY. Nature 174 (4420): 101-105. July 17, 1954.
A rather abstract paper which is in part a reply to Lehrman's critique (see WR 77: 7) of the theories of Lorenz and Tinbergen, and in part an explanation and elaboration of some current concepts of the ethologists.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY

Clarke, George L. (Harvard U.) ELEMENTS OF ECOLOGY. John Wiley & Sons, N. Y. Chapman & Hall, London. xiv + 534 p., illus. 1954. $7.50.
A well prepared college text in general ecology. Despite the title, it is fundamental rather than elemental. Plant and animal ecology are integrated by centering the treatment around such basic factors as light, temperature, nutrients, populations, succession, and relations within and between species. All ecology teachers should consider this book for use as a text or for collateral use by students, especially if no separate course in limnology or oceanography is offered at the institution. The author is an oceanographer, and he has placed major emphasis on marine conditions and marine examples. This has led to inclusion of much material not found in other general ecology texts. Terrestrial life is by no means ignored, but it is given less space than in other recent ecology texts. This book is very broad in scope and technical in approach, but it is not burdened with an excess of ecological jargon, mathematics, or methodology. Any major in biology should be able to read and understand almost all of it. He may, however, find himself swamped by the enormous number of separate facts and examples thrown at him in quick succession. The same comment can be made about almost any advanced text in ecology. One wonders if writers of ecology texts are not attempting to cover entirely too wide a field to permit an interesting, unified approach.

Coker, Robert E. (U. of N. C.) STREAMS LAKES PONDS. University of North Carolina Press. xviii + 327 p., illus. 1954. $6.00.
Dr. Coker's book is an excellent, semitechnical analysis of life in fresh waters. It is written in a pleasing, temperate fashion and is always readable. Complexities of physical, chemical, and biological factors are made interesting and almost simple. Animals and plants of different aquatic environments are discussed with profit and pleasure to the reader. Pollution and fish-pond management are treated at some length and with real wisdom and practicality. The book is too interesting to be called a text; for this reason it should be a splendid text for nonspecialists. Anyone with a little biological background can make good use of it. The interested layman could ask for no better introduction to the biology of fresh waters--if he is willing to look up technical

names now and then. Technical material is not omitted but it is presented simply and without condescension. One feels that the author knew what sort of book he wanted to write and wrote it without being trapped by desire to impress or to put everything he knew into it. References are cited throughout and it is a pleasure to say that both text and references are surprisingly up-to-date; a number of 1953 publications were used. Since the book is neither text nor handbook, we can only hope it receives the circulation it merits.--Fred H. Dale.

Drimmer, Frederick, editor. THE ANIMAL KINGDOM. Greystone Press (100 6th Ave., N. Y. 13.) Three volumes. 2,062 p., illus. 1954. $17.50. [From review in Outdoor News Bulletin 8 (21).]

A comprehensive natural history has real value not only in schools but for numerous technical workers seeking general information outside their specialities. The present set is thoroughly modern, treats all sorts of animals, and is the product of a team of experts from the American Museum of Natural History and the N. Y. Zoological Society. It is written in popular style and has more than 500 line drawings, 20 pages of color illustrations, and 92 pages of photographs. It is said to be the most complete and authoritative work of its kind in English. "Much information is given on the natural history of each animal; its habits, behavior, courtship, how it raises its young, and its relationship to man. Discussed also are the roles the animals played in primitive folklore and the curious customs of primitive peoples. The authors enliven their narratives with scores of anecdotes, many from first-hand experiences. Young or old, professional or amateur, none should be disappointed with this book."

Elton, Charles S., and Richard S. Miller. (Bur. Animal Population, Oxford, Eng., and Harvard U.) THE ECOLOGICAL SURVEY OF ANIMAL COMMUNITIES: WITH A PRACTICAL SYSTEM OF CLASSIFYING HABITATS BY STRUCTURAL CHARACTERS. Journal of Ecology 42 (2): 460-496. July 1954.

This paper forms a theoretical and practical background to the problems of ecological survey. It aims toward improving methods of recording and relating ecological events, so as to provide a general basis of knowledge about natural communities. In the study of animal communities we need to know not only how many niches there are in a community, but how these niches are filled, how dynamic balance between species is maintained, and how this balance may change, as through fluctuations in numbers or replacement of one species by another. The broad problems of ecological survey are discussed in three sections: (1) the historical development of ideas in community ecology, (2) an outline of theoretical and practical requirements, and (3) the limitations and opportunities of ecological surveys. In a fourth section, habitat structure is proposed as a basis for a simple classification of communities, using subdivisions whose scale is likely to correspond to real centers of dynamic actions in populations. At the same time the descriptive characters chosen are ones that can be readily applied to field problems in a standard way.--R. S. Miller.

Gale, Larry R., and Robert H. Myers. (Ky. Dept. Wildl.) KENTUCKY WILDLIFE. Kentucky Department of Fish & Wildlife Resources. 1-47 p., illus. July 1954.

Nontechnical account of game and fur mammals and upland game birds. Each species is shown in a large photograph and discussed in paragraphs on description, habitat, reproduction, food habits, status, and management. Much of the information is drawn from work in Kentucky. Paragraphs on management are relatively brief, intended for the general public. Biologists in other states may find greatest interest in the sections on status of such animals as bobcat, bear, grouse, fox squirrel, beaver, deer, and turkey.

WILDLIFE--BIOTAS, COMMUNITIES, GENERAL ECOLOGY--Continued

Galtsoff, Paul S., coordinator. GULF OF MEXICO / ITS ORIGIN, WATERS, AND MARINE LIFE. U. S. Fish & Wildlife Service, Fishery Bulletin 89. xiv + 604 p., illus. 1954. $3.25 from Superintendent of Documents.

"The purpose of this book is to summarize in a convenient form the present knowledge about the Gulf of Mexico." 55 distinguished workers from many institutions have contributed sections on their specialties. Among topics covered are geology, meteorology, physics and chemistry of waters, plankton, marine algae, flowering plants, bottom communities, bacteria, numerous groups of free-living invertebrates, parasitic worms, fishes, sea turtles, birds, mammals, and water pollution. There are also special sections on red tide, biology of commercial shrimps, biology of spiny lobster, oyster reefs, and commercial fishes. Levels of treatment vary widely. Some sections are detailed monographs with keys and descriptions of all categories from order to species. Other sections are short general discussions or lists of species. Sections on fishes and birds are biological rather than taxonomic. Each section has its own list of references. Obviously one volume cannot contain everything known about the Gulf of Mexico, but it is certain that everyone interested in the Gulf, or in oceanography generally, will find much of value in this book.

Irving, Laurence, and Simon Paneak. (Arctic Health Res. Center, Anchorage, Alaska.) BIOLOGICAL RECONNAISSANCE ALONG THE AHLASURUK RIVER EAST OF HOWARD PASS, BROOKS RANGE, ALASKA, WITH NOTES ON THE AVIFAUNA. Journal of the Washington Academy of Sciences 44 (7): 201-211, maps. July 1954.

Johnsen, Palle. BIRDS AND MAMMALS OF PEARY LAND IN NORTH GREENLAND INCLUDING NOTES FROM NORTHEAST GREENLAND. Meddelelser om Grønland, Bd. 128, no. 6. 140 p., illus. 1953. [From Polar Record 7 (48).]

"Observations in 1947 and 1948-49."

Miller, Wilford L. (N. D. Game Dept.) WILDLIFE IN NORTH DAKOTA. ix + 113 p., illus. 1954. $1.75. (Order from author, Box 563, Bismarck, N. D.)

An attractive, spirally bound, glazed paper booklet that is well illustrated with original photographs. Written popularly for educational purposes, the bulk of the text tells of the natural history, status, and conservation of the larger or more important animals. Animals of less general interest are discussed briefly by groups. Other sections discuss bird migration, refuges in state, animals in winter, how the state keeps track of game populations, and geography and life zones of N. D. Technical check lists are provided for birds, mammals, amphibians, and reptiles of state. Nineteen references are cited.

Rousseau, Jacques. FROM UNGAVA BAY TO THE TORNGAT MOUNTAINS: NOTES ON THE ANIMAL LIFE. Province of Quebec Association for the Protection of Fish and Game, 93rd Annual Report. p. 18-23. 1952. [From Polar Record 7 (48).]

"Quebec. Fish, birds and caribou observed in summer 1951. In English and French."

WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS

Andrewartha, H. G., and L. C. Birch. (U. Adelaide and U. Sydney.) THE DISTRIBUTION AND ABUNDANCE OF ANIMALS. University of Chicago Press, Chicago 37, Ill. xv + 782 p., illus. 1954. $15.00.

Perhaps the most important single work on population dynamics. Certainly it is required reading for advanced workers in all branches of animal ecology. It is not a compilation--it is a penetrating reinterpretation backed by voluminous data. The authors are Australian experts on biology and control of insects. Their deep knowledge of insect population biology is put to good use, as is their familiarity with theories and mathematics of such workers as Lotka, Volterra, Nicholson, Bailey, Lack, and Errington. Numerous examples, some from vertebrates, many from invertebrates, are thoroughly discussed as background for rejection or modification of previously proposed theories and explanation of the authors' own

WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS--Continued

proposals. Field and laboratory studies of factors (weather, food, other animals, place to live) that govern populations are analyzed at great length. The whole treatment is rigorous and critical, with mathematics used when necessary. Everything is explained in biological terms, however, and clarity of expression characterizes the book. The authors reject the commonly accepted idea that upper and lower population limits can be determined only by density-dependent factors. They reject the mathematical models on which the theory was based as unreal and unsupported by any substantial evidence. They believe, as do most wildlife workers, that populations are controlled by a wide variety of environmental factors, the most effective of which is determined by the nature of the species and its circumstances. They consider the logistic curve at length: basic assumptions, derivation, experimental evidence. They point out many weaknesses, but still feel that the logistic theory has certain uses. A few of the many other matters of general interest that are discussed thoughtfully are: calculation of innate capacity for increase, biology of dispersal, effects of underpopulation and crowding, competition and predation, phenomena of periodicity ("cycles"), rarity and extinction, and ecology in relation to genetics and origin of species. Wildlife biologists who are not conversant with ecological theory and mathematics find the book heavy going. We believe, however, that the basic concepts of wildlife biology are analyzed and formalized rather than challenged. --L. F. and W. H. Stickel.

Buckley, John L. (US F&WS, College, Alaska.) ANIMAL POPULATION FLUCTUATIONS IN ALASKA--A HISTORY. Trans. 19th N. Amer. Wildl. Conf. p. 338-354, graph. 1954.

Author's summary: "This paper, based on a review of published accounts and on replies to questionnaires, is a history of the more pronounced fluctuations of small game species in Alaska. Rock ptarmigan, willow ptarmigan, ruffed grouse, spruce grouse, sharp-tailed grouse, snowshoe hares, and arctic hares have tended to be most abundant near the middle of each decade since 1900. Evidence at hand suggests that the peak populations are not precisely synchronized as to area or species. Thus the hares have lagged a year or two behind the ptarmigan which in turn have lagged a year or two behind the other grouse in the same locations. Although a number of inconsistencies exist, it appears that peak populations and subsequent die-offs occur first in the north and west, with a lapse of up to two years before peaks occur in eastern and/or south-central Alaska. At the present time all small-game species are at high levels in most of the Territory; one or two areas have reported die-offs of one or more species this year. Several instances of emigration associated with high population levels are recorded. The population levels of fur-bearing animals, based on reports of furs shipped, are also included."

Christian, John J. (Naval Med. Res. Inst., Bethesda 14, Md.) THE RELATION OF THE ADRENAL CORTEX TO POPULATION SIZE IN RODENTS. Sc. D. thesis, Johns Hopkins School of Hygiene & Public Health. 124 p. May 1954.

Relationship between adrenal gland weight and population size was studied in white and wild male house mice in populations of fixed size, in freely growing populations of wild house mice, in rural and urban populations of Norway rats, and to a limited extent in wild populations of small mammals. Food, water, and nest space were provided in excess for captive populations. There was a significant correlation between adrenal weight and population size in mouse populations of fixed size. Increases in adrenal weight were correlated with increases in cortical width, especially of zona fasciculata. There was a moderate decline from peak weights when mouse populations in small cages became large enough for social structure to deteriorate. There was a suppression of reproductive function proportional to adrenal weight increase. These findings were duplicated in wild house mice of both sexes from populations that were allowed to reproduce at will. Populations that approached asymptotic levels exhibited a mean increase in adrenal weight of 29% as compared to isolated control values. Mice from populations of intermediate size had adrenals intermediate in weight between the high population and control values. Suppression of reproductive function proportional to population size was seen in both sexes. Adrenal weights from urban and rural rat

WILDLIFE--NUMBERS AND NUMBER FLUCTUATIONS--Continued

populations reflected population levels. Data were analyzed critically. It was concluded that stress proportional to population size was produced in populations of rats and mice, with resultant increase in adrenocortical size and suppression of gonadotrophic function.--J. J. Christian.

Park, Thomas. (U. Chicago.) EXPERIMENTAL STUDIES OF INTERSPECIES COMPETITION. II. TEMPERATURE, HUMIDITY, AND COMPETITION IN TWO SPECIES OF TRIBOLIUM. Physiological Zoology 27 (3): 177-238, graphs. July 1954.

Experimental work with laboratory populations of invertebrates usually has little direct application to wildlife management. It is important, however, to those who are especially concerned with the principles, theories, and mathematics of competition, predation, and allied phenomena. Wildlife Review cannot list many papers on this subject, but we believe that it is worthwhile to list some of them as an aid to those who may wish to go more deeply into the literature.

Schildman, George. (3750 N St., Lincoln, Neb.) WHAT IS THIS "GAME CYCLE?" Outdoor Nebraska 32 (3): 22-23, graphs. Summer 1954.

Some data on fluctuations in Neb. game are given in a popular article on cycles. Muskrats seemed to reach a peak in 1951-52 season after a low in 1947. Sharp-tailed grouse and prairie chickens were at a low in 1947, climbed to peak in 1951, declined in next two years. Cottontails also seemed to be at peak abundance in 1951 or 1952. Pheasants were low 1947-49, but rose to a peak in 1952, and then declined again. Graph shows grouse trend in state, 1943-53.

Slobodkin, L. Basil. (U. Mich.) CYCLES IN ANIMAL POPULATIONS. American Scientist 42 (4): 658-660, 666. Oct. 1954.

A discussion of the symposium on cycles that appeared in the J. Wildl. Mgt. for Jan. 1954. The author, who is an expert on laboratory populations, feels that the symposium represents a definite advance. Field biologists and mathematicians are still too far apart in their approaches, however, and both approaches have their weaknesses. The line of attack the author considers most promising is to create mathematical models that are founded as far as possible on data derived from field and laboratory studies, and then test the predictive powers of these models with the cyclic behavior of wild species for which the models are designed. "In practice this method has very seldom been used... ...by applying the full power of existing biological and mathematical knowledge to population problems, solutions of great scientific and practical significance will eventually be produced. Perhaps they will be found much sooner than there was any reason to expect before this symposium appeared."

Wing, Leonard W. (3875 Vorhies Rd., Ann Arbor, Mich.) GLOBAL PATTERN OF 4.222-YEAR CYCLES IN TEMPERATURE. Journal of Cycle Research 3 (3): 55-83, graphs. Summer 1954.

Author's summary: "A study of flight years of the Pine Grosbeak into the Lake States, commonly believed to be at 4-year intervals, reveals that it is a 3.94-year reversing cycle. One component of 4.222-years length has been used for an intensive study of global pattern in temperature. Tree rings showed a similar pattern. The 4.222-year cycle measured the same in a 570-year Pleistocene varve record from Ontario. The current time of ideal high and low was determined for each of 97 stations distributed over all continents. Lows were plotted on a latitudinal phase chart and showed a 'butterfly' pattern. The epochs of the 4.222-year cycle appear first in polar regions, presumably at the respective Poles, and slip equatorward simultaneously in both hemispheres. The slippage measures 70.7% of the length of the cycle. Other cycles seem to behave the same way and to have a slippage of the same proportion. Irrespective of length of the record, fewer than thirty years for some stations and 1,044 years for tree rings, the epochs, all treated alike, fall into a global pattern."

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS ETC.

Carhart, Arthur H. DEATH RIDES THE WIND. Sports Afield 132 (2): 17-21, illus. Aug. 1954.

Vivid account of effects of dust storms on wildlife. Animals of all types are affected. The author believes that even game officials may not realize the full damage that has been done recently. Dust storms have lethal effects in 3 ways: direct smothering, dust pneumonia, and loss of habitat. We cannot prevent drought and dust storms, but proper handling of land can do a great deal to minimize their effects.

Dahlen, James H., and Arnold O. Haugen. (Wis. Cons. Dept.) ACUTE TOXICITY OF CERTAIN INSECTICIDES TO THE BOBWHITE QUAIL AND MOURNING DOVE. Journal of Wildlife Management 18 (4): 477-481, graph. Oct. 1954.

From authors' summary: "Single acute dosages of aldrin, dieldrin, toxaphene, and lindane were administered to 212 quail and 64 mourning doves." Methods and symptoms are described. "The insecticides in order of decreasing toxicity were aldrin, dieldrin, toxaphene, and lindane. Doves were roughly three times as resistant to any given toxicant as quail. Female quail were more resistant than males to lindane. No sex difference in susceptibility was perceptible with the other compounds or with doves. Older birds appeared to be slightly more resistant than young... Dosages of lindane and toxaphene below those causing acute toxicity apparently did not affect breeding condition. No substantiated cases of insecticidal mortality in agricultural areas under natural conditions were obtained."

Dahlen, James H., and Arnold O. Haugen. (Wis. Cons. Dept.) EFFECT OF INSECTICIDES ON QUAIL AND DOVES. Alabama Conservation 26 (1): 21-23, illus. July-Aug. 1954.

Report of experiments with 276 penned birds. Table below shows amounts that may be expected to kill half the birds if birds are of average adult size (quail 6 oz., doves 4½ oz.).

	Quail	Doves
Aldrin	0.72 mg.	2.00 mg.
Dieldrin	2.21 mg.	5.70 mg.
Toxaphene	15.30 mg.	28.58 mg.
Lindane	21.25 mg. (males) 34.00 mg. (females)	47.63 mg.

Young quail seemed more sensitive to toxaphene and lindane. Most doves used were young of year and no age difference in susceptibility was discovered. Some of the quail that survived appeared normal later and laid eggs that hatched. Aldrin and dieldrin usually killed more quickly than toxaphene or lindane. Birds usually died within 5 days, often within 3. Symptoms of poisoning are described. Among the safer modern insecticides for use on areas where birds and mammals may be endangered are DDT, benzene hexachloride, toxaphene, and lindane. Toxaphene, however, is one of the most deadly to fish.

Hester, John M., and Archie D. Hooper. (Ala. Dept. Cons.) COTTON INSECTICIDES--A THREAT TO FISH LIFE! Alabama Conservation 26 (2): 6-7, 21, illus. Sept.-Oct. 1954.

Ingram, William Marcus, and Clarence M. Tarzwell. (U. S. Public Health Service.) SELECTED BIBLIOGRAPHY OF PUBLICATIONS RELATING TO UNDESIRABLE EFFECTS UPON AQUATIC LIFE BY ALGICIDES INSECTICIDES WEEDICIDES. U. S. Public Health Service Publication no. 400; Public Health Bibliography Series no. 13. [ii +] 28 p. 1954. 15¢ from Superintendent of Documents.

WILDLIFE--MORTALITY FROM INSECTICIDES, WEATHER, CARS, ETC.--Continued

Keefe, Jim. (Mo. Cons. Comm.) WILDLIFE AND THE DROUTH. Missouri Conservationist 15 (7): 1-7, illus. July 1954.
After 2 of the dryest years on record, Mo. conservation officials launched a survey of conditions in 36 counties in April 1954. The reports nearly fill this issue of the journal. The lead article is on wildlife, others are on forests and fisheries. Habitat conditions were poor, made worse by heavy livestock populations that were turned onto every bit of land that might afford a little food. Livestock had been allowed access to most farm ponds, often through necessity. Most of these ponds had low water levels, but those built to rigid specifications held up best. Quail and rabbit populations were hurt but in surprisingly good shape, with ample broodstock. Squirrels were high in consequence of good mast years. Raccoons continued high. Prairie chickens were down by 50% from the year before and their prospects are not good. Turkey reproduction was exceptionally good in last 2 years. Mink and muskrat numbers were down with the water levels. Established rose hedges withstood the dryness, but new plantings suffered heavily. The few farms that had good habitat invariably had good game populations, while some others were near-deserts. Figures are given on most points mentioned.

Rowe, V. K., and T. A. Hymas. (Dow Chem. Co., Midland, Mich.) SUMMARY OF TOXICOLOGICAL INFORMATION ON 2,4-D AND 2,4,5-T TYPE HERBICIDES AND AN EVALUATION OF THE HAZARDS TO LIVESTOCK ASSOCIATED WITH THEIR USE. American Journal of Veterinary Research 15 (57): 622-629. Oct. 1954.
Digest and tabulation of much information. "The hazard to livestock and wildlife associated with the use as recommended of herbicides containing 2,4-D, 2,4,5-T, MCP, and silvex is negligible."

WILDLIFE--MANAGEMENT--GENERAL

Anonymous. SOME INVESTIGATIONS OF THE ILLINOIS STATE NATURAL HISTORY SURVEY OF INTEREST TO SPORTSMEN. Illinois Wildlife 9 (4): 3-7. Sept. 1954.
Brief reports on numerous studies, some of which should be noted here. Eggs of ringneck pheasants from Calif. "are able to withstand moderately high air temperatures, 78°-90°F., much better than the eggs of Mid-western pheasants." Wide-row and mulch planting of corn are expected to help upland game populations, partly by providing better nesting cover. During the drought of 1953, bobwhites were as common in s. Ill. as any time in last 4 years, but were of odd behavior and hard to hunt. Report is made of bobwhite food habits during hunting season in s. Ill. (4,606 crops, 1950 and 1951). Prairie chicken habitat has been reduced in recent years, but figures show stability of population on Jasper Co. Study Area, where habitat presumably is stable. Intensive study has been launched of Canada geese at Horseshoe Lake: composition of flock in relation to trends, parasites and disease, physiological condition. Data are given on duck numbers in Ill. and migration routes in the Miss. Flyway. Trapping and marking of cottontails revealed that only about 18.5% of a local population was taken in 14 days of extremely intensive hunting. Rabbits of 3 public shooting grounds were considerably higher in 1953 than in 2 years before. Tests of various means of improving farm wildlife habitat are discussed.

Beckwith, Stephen L. (U. Fla.) ECOLOGICAL SUCCESSION ON ABANDONED FARM LANDS AND ITS RELATIONSHIP TO WILDLIFE MANAGEMENT. Ecological Monographs 24 (4): 349-376, illus. Oct. 1954.
Based on several years of study of various tracts near Ann Arbor, Mich. Stages of succession and factors that cause them to vary and overlap are described in some detail. The stages considered range from ploughed field to forest. Occurrence and abundance of birds and mammals, especially game forms, are correlated with successional stages. Implications for management are discussed in connection with each stage.

WILDLIFE--MANAGEMENT--GENERAL--Continued

Eklund, Carl R. (US F&WS.) WILDLIFE HABITAT DEVELOPMENT AT RESERVOIRS. Trans. 19th N. Amer. Wildl. Conf. p. 368-374. 1954.
Discusses arrangements that can be made with construction agencies for wildlife lands and developments intended to compensate for wildlife values lost through impoundments. Examples are given of wildlife management areas being developed under such arrangements. Wildlife management at federal construction projects is often done by states with federal assistance.

Riley, Charles V. (Kent U., Ohio.) THE UTILIZATION OF RECLAIMED COAL STRIPLANDS FOR THE PRODUCTION OF WILDLIFE. Trans. 19th N. Amer. Wildl. Conf. p. 324-336. 1954.
Report of a detailed study made chiefly in Ohio. Extent, nature, physical and chemical factors, vegetation, waters, wildlife, and fishes of stripmined areas are considered and many quantitative data are supplied. Comparisons are made with cropland, abandoned cropland, and forestland. Stripped lands had surprisingly good variety (12 species) and numbers of game animals. Cottontails were commoner there than on other land types. Raccoons were less common than in forest, but woodchucks were more so. Songbirds were more numerous in both species and individuals than in types compared. Fifteen species of waterfowl used stripmine lakes; mallards and wood ducks nested. Muskrats, minks, and beavers occurred in the lakes; 2 lakes produced muskrat harvests of 3 and 8 per acre. Fifteen kinds of fish were present and their growth was as good as elsewhere. Responses of various plants are described.

Scott, Robert F. (US F&WS, Fairbanks, Alaska.) POPULATION GROWTH AND GAME MANAGEMENT. Trans. 19th N. Amer. Wildl. Conf. p. 480-502, graphs. 1954.
A nonmathematical discussion of the sigmoid growth curve and its many applications to animal populations and therefore to principles and practice of wildlife management. Irruptions, optimum yield, and age distributions are some of the topics considered. All wildlife biologists should understand the implications of the logistic curve; this paper provides a thoughtful and well rounded explanation and covers many practical ramifications. For wildlife purposes, a better digest of the subject is not likely to be found.

Sheridan, P. H. D. PRISONERS CAN SAVE YOUR HUNTING AND FISHING. Sports Afield 132 (4): 76-79, illus. Oct. 1954.
Mich., Wis., and Calif. are using carefully selected prisoners (none accused of crimes of sex or violence) for worthwhile conservation work. This article describes Mich. methods and results, which seem to be highly satisfactory. Prisoners not only plant trees, fight fires, and do construction work; they also help with wildlife studies in semitechnical capacities and do many other things. The plan is good for the public and good for the men. Much work gets done that could not be attempted otherwise. The system is recommended to other states.

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING

Anonymous. WHERE DO WE STAND NOW? Washington State, Game Bulletin 6 (4): 1, 12. Oct. 1954.
Washington has an exceptionally dynamic and successful program for improving farmer-sportsman relationships. "The trespass problem is in no way as acute today as it was eight years ago and each year we are making gains... The actual number of landholders who post in this state is diminishing annually and the abuse of property by sportsmen is likewise diminishing." This article tells how the program works and reports on progress. [For another paper which is somewhat more illuminating to the technician but covers much of the same ground, see W. A. Hunter, WR 77: 12.]

WILDLIFE--MANAGEMENT--HARVESTS AND HUNTING--Continued

Bailey, Wayne. (W. Va. Cons. Comm.) BEAR, BEAVER AND TURKEY KILLS. West Virginia Conservation 18 (6): 12-13, illus. Aug. 1954.
Reported bear take in W. Va. in 1953 was 85, highest since 1949, when it was 181. Illegal kills were about 40%. Beaver harvest of early 1954 was 533, 60% over 1953. The 1953 turkey kill of 649 was third highest since reports became mandatory in 1940, and was 49% over 1952. Kill reports are incomplete, however. There is believed to be a direct correlation between poult survival (average Sept. brood size) and kill. A table shows total reported kills of bear and turkey, 1949-53, and beaver, 1949-54.

Legler, Eugene, Jr. (Tenn. Game Comm.) STATE'S 1953-54 GAME HARVEST. Tennessee Conservationist 20 (9): 18-19. Sept. 1954.
Hunting statistics and estimated total kill for each type of game in Tenn. Trends are not discussed.

Prescott, George. THE FEUDIN'S DONE ENDED. Outdoor Life 113 (6): 50-51, 82-86, illus. June 1954.
The Kittitas Valley of central Wash. is good hunting country and good farming and ranching country. Hunters flooded in each fall and caused ranchers huge damage to stock, tanks, fences, and range (latter by fire). Feelings were hard and much land was posted and guarded. But in 1953, cattlemen, hunters, and state officials got together on a plan that worked so well that it is to be tried again in 1954. In essence the plan provides for cattlemen to withdraw their stock into relatively small holding pastures during hunting season. These areas are clearly posted and are not hunted by anyone. Remaining areas are posted for open hunting, or for entry only by hunters afoot or on horse, or for hunting only by permission. Many media were used to urge hunters to cooperate. Hunting went well and little damage was done. Costs of moving stock were considerable, but far less than damage costs had been. Hard feelings on both sides largely died down, and malicious damage by hunters practically ceased.

Wolf, Bill. TODAY'S GAME LAWS INVITE VIOLATIONS. Sports Afield 132 (3): 17-21, illus. Sept. 1954.
Game laws are utterly confusing to anyone but a lawyer. A person cannot tell what is legal, but illegal procedures are spelled out so clearly as to provide a textbook for the would-be violator. Some states have found their game laws so incomprehensible that they have quit distributing them. The author suggests "that when we buy our licenses, our states will furnish us a booklet telling us--in simple English--only what is legal. We can just assume anything else is illegal."

WILDLIFE--MANAGEMENT--FARM

Blackwell, William P. (Va. Comm. Game.) IMPROVING CROP AND HAYFIELDS FOR GAME. Virginia Wildlife 15 (8): 20-21, illus. Aug. 1954.
Discusses agricultural practices that favor quail and other wildlife. Growing of Korean lespedeza, peanuts, and soybeans often is beneficial. It helps to leave a little of the crop unharvested near good cover. And protection of brushy cover on odd spots is important. Many native plants (some named) of use to wildlife will volunteer where they are allowed to, and others can be planted. Good quail foods can be encouraged simply by discing land in spring. Unharvested strips of seed crops are as good as food patches. A strip or patch of unmowed hay provides food and cover. When corn is picked by machine, much is left for wildlife if plowing is delayed until spring. Grazing is unfavorable on Va. game lands; and management of grazing lands for wildlife is a problem.

WILDLIFE--MANAGEMENT--FARM--Continued

Bumsted, Alec R. (340 N. Madison St., Tupelo, Miss.) A METHOD OF OBTAINING BETTER UTILIZATION OF SHRUBS BY LANDOWNERS. Journal of Wildlife Management 18 (4): 539-540. Oct. 1954.
Excellent results were obtained by notifying applicants for L. bicolor that supply was so small and demand so great that plants could be provided only to those who prepared ground in advance and sent card to biologist when ground was ready. Applicants so handled gave 85% success for plots as compared to 26% for applicants who were well recommended and to whom plants were delivered without preparation of ground in advance. These results prevailed despite the fact that follow-up visits of encouragement were made to the group that gave 26% success and none were made to the group that gave 85% success.

Casebeer, Robert L. (Idaho Game Dept.) PRIVATE LANDS AND WILDLIFE. Idaho Wildlife Review 7 (2): 4-7, 11, illus. Sept.-Oct. 1954.
The Idaho Fish and Game Department works through soil conservation districts to get many kinds of wildlife management measures on private lands. Owners learn of the service through the districts and request help and advice. Department biologists inspect areas and make recommendations before work begins. An agreement stipulates just what the state will do and what the owner will do. Supervisors of each district review the program each year with representatives of sportsmen and the department. The department also works with the SCS technicians, and in 1954 held a 2-day fish and game training school for them. Two years of results of the program are summarized.

Odin, Clyde R. (N. D. Game Dept.) HABITAT EVALUATION. North Dakota Outdoors 17 (1): 8-9, diagram. July 1954.
Outlines methods N. D. will use in evaluating its habitat improvement program. The aim is a dollars and cents appraisal, as well as determination of what works and what does not.

Quinn, I. T. (Va. Comm. Game.) MORE FENCEROWS FOR WILDLIFE. Virginia Wildlife 15 (8): 16-17, illus. Aug. 1954.
Tells of values of unburned and ungrazed fencerows and suggests preserving mast trees and leaving a few rows or corners of crops unharvested for benefit of game animals.

Rettinger, D. O. AN EVALUATION OF BICOLOR LESPEDEZA, LESPEDEZA BICOLOR, TURCZ, IN SOUTHERN ILLINOIS. M. A. thesis, Southern Illinois University. 52 p. June 1954.--W. D. Klimstra.

Shaffer, C. H. (Va. Comm. Game.) A NEGATIVE APPROACH TO GAME ABUNDANCE. Virginia Wildlife 15 (10): 20-22, illus. Oct. 1954.
A lot of costly, difficult measures are used in the name of game management. Some work and some do not, but all take time, work, and money. We can do a great deal of good for game by simply NOT doing certain things: not breaking game laws, not allowing dogs and cats to run wild, not farming too close to fencerows and similar borders, not eliminating good native cover, not harvesting grain and lespedeza right up to the fences and woods, not destroying tree and ground dens, not shooting into leaf nests, not having den trees cut in the course of lumbering, not doing indiscriminate burning, and not burning brush piles. The author elaborates on all these points. His central idea is well worth pondering. Its implementation may be difficult, for there is no fancy gimmick to sell, but the potentialities are enormous.

WILDLIFE--MANAGEMENT--FOREST AND RANGE

Anonymous. HOGS AND TAXES RECEIVE ATTENTION IN LOUISIANA. Journal of Forestry 52 (10): 807-808. Oct. 1954.
The 1954 La. legislature made it illegal to allow hogs to roam in pinelands. The law provides for impoundment of hogs and fines for owners. A constitutional amendment to be submitted to the people for vote provides that trees will not be taxed until cut. Both steps are considered highly desirable for conservation.

WILDLIFE--MANAGEMENT--FOREST AND RANGE--Continued

Biswell, H. H. (U. Calif.) THE BRUSH CONTROL PROBLEM IN CALIFORNIA. Journal of Range Management 7 (2): 57-62, illus. March 1954.
General review of present situation: types of chaparral, importance of wildfires, factors governing increase of brush, benefits from brush control, methods of brush removal, reseeding, grazing management. The paper is based largely on PR studies.

Carhart, Arthur H. SAGEBRUSH IS GOING! Audubon Magazine 56 (5): 200-204, illus. Sept.-Oct. 1954.
Sagebrush is being eliminated over vast areas to establish grass ranges for livestock. Many millions of acres of public lands will be treated eventually. With the sage will go the sage hen and the large part of the mule deer population that depends on sage for winter food. Also hard hit will be sage sparrow, Brewer's sparrow, and sage thrasher. The author examines economics of sage removal and concludes that it would be far cheaper to reduce grazing pressure and let grass eliminate sage, as it will on some sites, than to use artificial methods.

Dobie, John G., and William H. Marshall. (Minn. Dept. Cons.) NOTES ON THE RESULTS OF CERTAIN CCC PLANTINGS ON THE PAUL BUNYAN STATE FOREST, MINNESOTA. Journal of Wildlife Management 18 (4): 531-533. Oct. 1954.
Plantings of white spruce and white cedar made for game cover in 1936 were evaluated in 1953. "In conclusion it must be stated that the plantings did not appear to have contributed to game cover. This was thought to be due primarily to inability of small conifers to withstand the shade of the aspen over-story or survive on dry sites and secondarily to pressure from present high deer and rabbit [Lepus americanus] populations." A drought of several years followed planting. Deer damage was solely from rubbing.

Holmgren, P. C. A COMPARISON OF BROWSE SPECIES FOR REVEGETATION OF BIG-GAME WINTER RANGES IN SOUTHWESTERN IDAHO. U. S. Forest Service, Intermountain Forest and Range Experiment Station (Ogden, Utah), Research Paper no. 33. 12 p. May 1954. [From Journal of Forestry 52 (10).]

Johnson, Fred W. (U. S. Forest Service, Missoula, Mont.) SOME OBSERVATIONS ON GAME AND GAME RANGE TREND IN SOUTHERN KENYA, BRITISH EAST AFRICA. Trans. 19th N. Amer. Wildl. Conf. p. 534-538. 1954.
Tsetse-fly areas that were studied have no livestock but do have large numbers of ungulates. Range is well utilized but in good shape owing to presence of predators, disease, favorable conditions of soil and weather, and fire conditions. Predators are encouraged and hunting is controlled. The range and wildlife resources are in fine shape and conditions are virtually primeval. In contrast, areas where tsetse flies are controlled are overgrazed by livestock, including goats, plant succession is set back to a poor stage, most remaining plants are of unpalatable types, game is scarce, and there is much bare soil and heavy soil erosion. Native beliefs are such that little can be done to control grazing or improve range. "People of Kenya who are interested in game and game range believe that tsetse fly control, if successful, will mean almost complete destruction of the remaining original plains game habitat."

Marsh, Alfred H. THE INFLUENCE OF SILVICULTURAL THINNINGS ON THE PRODUCTION OF KEY FOODS OF THE WHITE TAILED DEER AND RUFFED GROUSE. M.S. thesis, University of Idaho. 66 p. 1954.

Staebler, George R., Paul Lauterbach, and A. W. Moore. (U. S. Forest Service.) EFFECT OF ANIMAL DAMAGE ON A YOUNG CONIFEROUS PLANTATION IN SOUTHWEST WASHINGTON. Journal of Forestry 52 (10): 730-733. Oct. 1954.
Study of first 4 years of 1 plantation. "The important conclusions are: 1. The plantation was successful in an area where mountain beaver and deer populations were high. After one or two growing seasons it also withstood heavy rabbit [Lepus americanus] damage. Extensive damage, while causing a high percentage of deformed trees and severe reduction of height growth, did not lessen survival appreciably. 2. Rabbit [Lepus] populations built up extremely fast,

WILDLIFE—MANAGEMENT—FOREST AND RANGE—Continued

resulting in extensive damage. It should be assumed that the experimental planting succeeded because of an opportune timing of establishment. 3. Damage from mountain beaver was negligible... 4. ...Douglas-fir was the most damaged species, although deer did considerable damage to Port-Orford-cedar after the third year. Hemlock seedlings were apparently avoided. 5. Douglas-fir, even though most damaged, was superior to the other species in survival and height growth." 6. Heavy bracken was poorest type for plantation because of competition from bracken and because of Lepus concentrations in this type, especially in summer. 7. Not all deformity was caused by animal damage.

WILDLIFE—MANAGEMENT—WET-LAND

Bartsch, A. F. (U. S. Public Health Service.) PRACTICAL METHODS FOR CONTROL OF ALGAE AND WATER WEEDS. Public Health Reports 69 (8): 749-757, illus. Aug. 1954. Reprint 10¢ from Superintendent of Documents.
Several methods are discussed and 34 references are cited.

Dorer, Richard J. (Minn. Dept. Cons.) SAVE MINNESOTA'S WETLANDS. Minnesota Naturalist 5 (1): 1-5, illus. Sept. 1954.
After discussing the terrible damages that soil and water erosion and loss of water resources have done to this nation, the author points out that the rate of erosion is as great as ever and that we are still draining every possible wet spot regardless of consequences. Drainage has made floods worse and has eliminated much wildlife cover. Crop surpluses overflow storage space yet the government aids more drainage. Instead, the government should give the SCS funds to get every acre of plow and pasture land under good management, which would make it unnecessary to create additional agricultural lands. Our 240,000,000 acres of eroded land should be built up and kept in reserve. The Minn. Bureau of Game is purchasing all the desirable wetlands it can. It has bought or optioned 11,325 acres and this is just a start. Donations for a "Save Minnesota's Wetlands Fund" are coming in. Plans are to acquire some 209,000 acres at a cost of about $6,500,000. Much public understanding and cooperation will be needed.

Rose, Earl T. (Iowa Cons. Comm.) TOXIC ALGAE IN IOWA LAKES. Proceedings Iowa Academy of Science 60: 738-745. 1953.
Material is generally similar to that presented earlier (see WR 73: 22).

Steenis, John H., Norman G. Wilder, Henry P. Cofer, and Robert A. Beck. (US F&WS and Del. Game Comm.) THE MARSHES OF DELAWARE, THEIR IMPROVEMENT AND PRESERVATION. Delaware Board of Game and Fish Commissioners. 1-42 p., illus. June 1954.
An attractive booklet, almost a photo-story, designed to inform the public of the value of marshes, factors threatening marshes, and many methods of marsh management. Among the management methods briefly described are drawdowns, pools, blind ditches, burning, ditch plugs, trapping, food planting, and carp control. Control of undesirable plants by flooding, water-level management, mechanical means, and chemicals is discussed in more detail, often with specific instructions. At end of pamphlet is a list of plants mentioned and a list of recommended references.

WILDLIFE—MANAGEMENT—PREDATION, CROP DAMAGE, AND CONTROL

Arnold, David A. (Cons. Dept., Lansing, Mich.) PREDATOR CONTROL IN MICHIGAN—WHEN, WHY, AND HOW. Trans. 19th N. Amer. Wildl. Conf. p. 141-150, graphs. 1954.
"In the past three decades...the Conservation Department's attitude towards predators has evolved from one of wanting as few as possible of these animals to one of striving for control only when and where needed. The high recreational potential of most Michigan predators is becoming more apparent each year and the present policy is to promote these sports as much as practicable." There is no need to control coyotes and wolves in upper Mich., for deer there are underharvested and much of range is overbrowsed. Several studies discussed give no

WILDLIFE--MANAGEMENT--PREDATION, CROP DAMAGE, AND CONTROL--Continued

indication that foxes are affecting pheasant populations in Mich. and other states. The same holds for other small game species and their predators. Protection of domestic animals is a different problem, one for which extension trapper system has worked excellently in Mich. and Mo. Evidence is given that bounties are ineffective and costly. A study reported here demonstrates that kill (and presumably populations) of red foxes does not fluctuate in correlation with monetary incentive for kill. Data are from several states.

Dermid, Jack. (N. C. Wildl. Resources Comm.) WHAM! AND THE DEER SCAMPER. Wildlife in North Carolina 18 (10): 12-13, illus. Oct. 1954.

Smoldering ropes that periodically set off powerful firecrackers are being tried in N. C. to drive deer, bear, waterfowl, and other animals from crops. A rope with 12 firecrackers burns about 6 hours with explosions approximately every half hour. It may protect several acres. The method is inexpensive and adaptable.

WILDLIFE--REPORTS OF ORGANIZATIONS

Louisiana. FIFTH BIENNIAL REPORT...WILD LIFE AND FISHERIES COMMISSION 1952-53. [vi +] 173 p., illus. 1954.

This is one of the largest and most informative of state game and fish department reports. Its many large, 2-column pages allow space for numerous reports, some of which are long and detailed enough to have been separate research publications. Some subjects treated are: control of water hyacinth and other pest aquatic plants; studies of doves, woodcock, snipe, waterfowl, deer, turkey, acorn production, rabbits, squirrels, quail; development of farm game habitat and wildlife management areas; work done on refuges; pollution control; harvests and values of furs (by species, and by 4-5 year periods, 1940-53).

Maryland. MARYLAND BOARD OF NATURAL RESOURCES / TENTH ANNUAL REPORT / 1953. xiii + 167 p., illus. [1954?]

Reports of Department of Game and Inland Fish (p. 53-69) and Department of Research and Education (p. 121-148) take up briefly: accomplishments in game habitat improvement projects, game-farm birds released, game mammals live-trapped and released, predator trapping, muskrat-waterfowl investigations, and age ratios of hunter-killed dove and quail.

New York. CONSERVATION DEPARTMENT / FORTY-SECOND ANNUAL REPORT / FOR THE YEAR 1952. Legislative Document (1953) no. 27. 1-369 p., illus. 1953.

Report of Division of Fish and Game (p. 109-243) includes brief descriptions of wildlife investigation projects, accounts of work done in game management districts, statements of accomplishments in game management projects, notes on rabies control program, descriptions of hunting and trapping regulations, data on pheasant trends in N. Y. (1945-52), numbers of beaver pelts tagged (by county, 1946-52), tables showing deer take (by counties, 1952), and quantitative data on work of game farms.

North Dakota. ANNUAL REPORT, GAME & FISH DEPARTMENT / JULY 1, 1952 TO JUNE 30, 1953. 1-48 p., illus. 1953?

Includes estimates of waterfowl populations and kills in each of last 4-6 years, data on breeding conditions and harvests of upland game birds, information on antelope harvest, estimated kill and hunting statistics for deer, census data for late winter deer populations (by regions) 1949-53, account of work in habitat development, statement of beaver harvest, remarks on status of other fur animals, pelt prices in 1951-52, and report of game farm work. It is worth noting that the late-winter deer census indicated a population drop of 45.2% in a year's time. The drop is attributed to the 1952 shooting season, when open weather attracted an exceptionally large number of hunters, and when about 3 out of 4 hunters got a deer.

WILDLIFE--REPORTS OF ORGANIZATIONS--Continued

Pennsylvania. BIENNIAL REPORT 1953-1954 / PENNSYLVANIA GAME COMMISSION. Pennsylvania Game News 25 (11): 69-128, illus. Nov. 1954.
Good summary of projects and other activities. Includes figures on bear damage claims, bounties, fur harvest, game propagation, duck banding, kill of all classes of game, cooperative farm-game program, state game lands, and brief accounts of wildlife management and research projects.

PROVANCHER SOCIETY / 1948-49. Published by the Society (12, Ave Désy, Quebec City). 1-56 p., illus. 1953?
This annual report for the years 1948-49 includes accounts of society activities, a 4-page discussion of the life and works of Father Provancher, a 2-page paper by Helen G. Cruickshank on flesh colors of breeding birds, a 5-page report by A. A. De Champlain on the natural history of l'Île St. Barnabé in St. Lawrence River, and notes on the natural history of Basque Island.

THE PROVANCHER SOCIETY OF NATURAL HISTORY OF CANADA / 1950-1951. Published by the Society (12, Ave Désy, Quebec City). 1-86 p., illus. 1954?
First few pages are devoted to society affairs, but bulk of report consists of a good semipopular account of "The Mammals of Southeastern Quebec" by A. W. Cameron, which is reviewed on p. 28.

Texas. ANNUAL REPORT OF THE GAME AND FISH COMMISSION...FOR THE FISCAL YEAR 1952-1953. 1-46 p. 1954?
Includes: brief descriptions of management and research projects; summary of scaled quail study being made by Cooperative Wildlife Unit; figures on deer, turkey, and beaver transplants; figures on birds banded; summary of activities in education and publication; and estimates of deer and turkey kill in each county.

West Virginia. [ANNUAL REPORT OF CONSERVATION COMMISSION FOR 1953-54.] West Virginia Conservation 18 (8): 1-40 p., illus. Oct. 1954.
Report on game management (p. 20-29), by C. O. Handley, Sr., provides much substantial and interesting information on deer investigations; deer kill; study of quail, rabbit, and squirrel populations and effect of hunting on them; kill and related data for turkey and bear; plans for evaluating farm wildlife developments; progress of management work on farm, forest, and waterfowl areas; steps taken in fox control; beaver harvest and pelt prices; and restocking of various types of game. The report constitutes a good summary of work and findings and has real reference value.

MAMMALS--GENERAL

Barbehenn, Kile R. (Dept. Cons., Cornell U.) HANDLING SMALL MAMMALS. Journal of Mammalogy 35 (3): 429. Aug. 1954.
Small plastic bags in which vegetables are sold have many advantages over cloth bags, but user must watch carefully for tears.

Burns, Eugene. THE SEX LIFE OF WILD ANIMALS. A NORTH AMERICAN STUDY. Rinehart & Co., N. Y. xiii + 290 p. 1953. $3.00. [Copy of review by L. J. and M. J. Milne, Quarterly Review of Biology 29 (1).]
"This comparative study of the sex life of wild mammals in North America brings together for the first time information on the mating habits of a great variety of kinds--from the tiny shrew to the ponderous whale. Its author brings to the subject freshness from his long experience as timber cruiser, park ranger, and veteran angler--activities which furnished frequent opportunity to observe mammals undisturbed. Yet the approach is scholarly, well indexed though without documentation or illustration. Example follows example in logical fashion as the discussion leads from anatomical features into social organization, the antics of mate seeking, gestation, birth and nursing, training toward replacement, and the inevitable trend toward overpopulation."

MAMMALS--GENERAL--Continued

Fowle, C. David, and R. Y. Edwards. (Ont. Dept. Lands & Forests, Maple.) THE UTILITY OF BREAK-BACK TRAPS IN POPULATION STUDIES OF SMALL MAMMALS. Journal of Wildlife Management 18 (4): 503-508. Oct. 1954.
Experiments made in Ontario with sunken bucket traps surrounded by snap traps; with various baits; with response of captive Blarina to baited but unset traps, and to sunken bucket. Sunken buckets took far more small mammals than did snap traps that encircled them. Cheese was better bait than bacon grease or rolled oats. "It is shown that, under the conditions of the experiments, the numbers of animals taken [in snap traps] may not bear any relation to the numbers of animals passing over the area where traps are located. Failure of traps to take animals actually present may be explained by ineffectiveness of bait or by the tendency of animals to avoid new and strange objects."

Miller, Gerrit S., Jr., and David H. Johnson. (U. S. Nat. Mus.) BIBLIOGRAPHY OF GERRIT SMITH MILLER, JR. Journal of Mammalogy 35 (3): 329-344. Aug. 1954.
Lists 400 titles that range in date from 1888 to 1954.

Penniman, T. K. PICTURES OF IVORY AND OTHER ANIMAL TEETH, BONE AND ANTLER, WITH A BRIEF COMMENTARY ON THEIR USE IN IDENTIFICATION. Oxford, Pitt Rivers Museum, Occasional Papers on Technology 5. 40 p., 20 plates. 1952. [From Polar Record 7 (48).]
"Well-illustrated guide to identification of materials used in ethnological specimens. Includes mammoth, walrus and Narwhal tusks, Sperm Whale teeth, reindeer and Elk antler, and bone."

Rand, A. L. (Chicago Nat. Hist. Mus.) THE ICE AGE AND MAMMAL SPECIATION IN NORTH AMERICA. Arctic 7 (1): 31-35. June 1954.
Refugia of the ice age are used to explain present distribution and relationships of mammals of the genera Sorex, Tamiasciurus, Martes, Ovis, Citellus, Ursus, Microtus, Clethrionomys, Odobenus, and Rangifer.

Shamel, H. Harold, and others. (Cherryvale, Kans.) GERRIT SMITH MILLER, JR. Journal of Mammalogy 35 (3): 317-329, portrait. Aug. 1954.
Biographical and personal information about one of the world's greatest mammalogists.

Thompson, Seton H. ALASKA FISHERY AND FUR-SEAL INDUSTRIES: 1951. U. S. Fish & Wildlife Service, Statistical Digest no. 31. iv + 70 p., illus. 1954. 35¢ from Superintendent of Documents.
Pages 50-70 contain considerable information on the fur-seal industry and other matters pertaining to the Pribilof Islands. Subjects include: harvest of seal and blue-fox pelts, quantities of byproducts, studies under way on seals, changes in physical plant, remuneration of natives, counts of fur-seal bulls, disposition of pelts and prices paid for them. It is interesting to note that 7 buck and 24 doe reindeer were stocked on St. Paul Island. Stock introduced in 1911 peaked and crashed owing to range exhaustion, according to Scheffer (see WR 69: 27); in 1951 there were only 2 left on St. George Island and 3 on St. Paul Island. The present report does not discuss plans for safeguarding the range.

Thompson, Seton H. ALASKA FISHERY AND FUR-SEAL INDUSTRIES: 1952. U. S. Fish & Wildlife Service, Statistical Digest no. 33. iv + 68 p., illus. 1954. 35¢ from Superintendent of Documents.
Pages 52-68 give much information on fur-seal harvest (total 63,922), byproducts, counts of fur-seal bulls, physical improvements on the Pribilofs, native affairs, and related matters. Owing to low pelt prices, no foxes were trapped. Attempts were made to eliminate foxes on St. Paul Island because they were considered inferior. Reindeer had disappeared on St. George and this island is not believed to be suitable for them. The 31 reindeer placed on St. Paul Island in 1951 had increased to 52. Dr. H. C. Hanson reported that range on St. Paul was fair to poor owing to past overuse, and that its capacity was about 250 reindeer.

MAMMALS--FAUNAS AND MANUALS

Blair, W. Frank. (U. Texas.) MAMMALS OF THE MESQUITE PLAINS BIOTIC DISTRICT IN TEXAS AND OKLAHOMA, AND SPECIATION IN THE CENTRAL GRASSLANDS. Texas Journal of Science 6 (3): 235-264, map. Sept. 1954.
Long annotated list of species, description of associations, analysis of distributional changes and faunal elements, and thoughts on speciation in the grasslands.

Cameron, Austin W. (Nat. Mus. Canada.) THE MAMMALS OF SOUTHEASTERN QUEBEC. Report of Provancher Society (12, Ave Désy, Quebec City) for 1950-1951. p. 20-86, illus. 1954?
Good semipopular account of all mammals, including marine, of Quebec Province south and east of St. Lawrence River. Introduction discusses mammals generally and tells of nature of country. Most of paper consists of species accounts. A typical species account runs half a page or a page and has paragraphs on recognition characters, measurements, natural history, distribution in Canada, localities in southeastern Quebec, and subspecies (if any). The paper should be of real utility to interested laymen and amateurs, and sections on local occurrence and subspecies should be of value to professionals.

Ingles, Lloyd Glenn. (Fresno St. Coll.) MAMMALS OF CALIFORNIA AND ITS COASTAL WATERS. Stanford University Press. xiii + 396 p., illus. 1954. $6.00.
This revision of "Mammals of California" is an exceptionally well designed handbook for study of a large and complex mammalian fauna. It is intended for amateurs and students of natural history. Photographs, drawings, and line drawings are numerous and good and are well integrated with text and keys. Text is simple and popular but necessarily somewhat technical at a few points, as in the key to skulls of genera. Subspecies are mentioned only incidentally. Gratifying emphasis is placed on identification of species; in this respect the author sets a new standard for writers of semitechnical mammalogies. A simple key to groups is given and there is a pictorial key for species of each group. Here diagnostic features are pointed out on good drawings, Peterson style, and paragraphs on facing pages give more data on recognition characters and habitats. Technical characters are illustrated and used where needed. Range maps are supplied for most species. Only use will determine how well one can identify mammals with this book, but the approach certainly seems sound and commendable. The body of the text tells of the natural history of species or, in large groups, of representative species. Introductory chapters present simple treatments of mammals in general, orders of mammals, fossil mammals, importance of mammals, how to study mammals, and how to use the book. A long appendix includes sections on collection and preparation of specimens, dental formulae, key to skulls of genera, illustrated guide to scat identification (this subject is made to seem too simple and precise), pronunciation of some generic names, principles of classification, and check-list for state (to species). Tracks are illustrated throughout text.

Vaughan, Terry A. MAMMALS OF THE SAN GABRIEL MOUNTAINS OF CALIFORNIA. University of Kansas Publications, Museum of Natural History, 7 (9): 513-582, illus. Nov. 1954.
Includes description of area and its associations, discussions of factors affecting mammalian ranges, and relatively long species accounts. These accounts provide quite a bit of information on ecology, habits, foods, and enemies. Several contain taxonomic notes.

MAMMALS--COMMUNITIES, NUMBERS, HOME RANGES

Beer, James R., Paul Lukens, and David Olson. (U. Minn.) SMALL MAMMAL POPULATIONS ON THE ISLANDS OF BASSWOOD LAKE, MINNESOTA. Ecology 35 (4): 437-445, map and graph. Oct. 1954.
Occurrence of hibernators and nonhibernators on mainland and islands, relative abundance of species, relative vulnerability of species to trapping, increase in number of islands occupied, population fluctuations on islands and mainland.

MAMMALS--PARASITES AND DISEASES

Ballantyne, E. E., and J. G. O'Donoghue. (Alberta Dept. Agr., Edmonton.) RABIES CONTROL IN ALBERTA. Journal of the American Veterinary Medical Association 125 (931): 316-326, illus. Oct. 1954.

In 1952 and 1953, a rabies epizootic spread through Alberta, probably from the N.W.T. Many wild and domestic animals were affected. An exceptionally vigorous campaign against rabies was launched. People were educated, dogs were controlled and vaccinated, and predators were greatly reduced by trapping, shooting, snares, cyanide baits, strychnine baits, cyanide guns, and some 1080 stations. The project was conducted by provincial employees and many private individuals. Numerous ingenious techniques are described and some of the results are summarized. About 200 people took Pasteur treatments but not one person got rabies.

Judd, W. W. (U. of Western Ont., London, Ont.) SOME RECORDS OF ECTOPARASITIC ACARINA AND INSECTA FROM MAMMALS IN ONTARIO. Journal of Parasitology 40 (4): 483-484. Aug. 1954.

Magath, Thomas B. (Mayo Foundation, Rochester, Minn.) THE IMPORTANCE OF SYLVATIC HYDATID DISEASE. Journal of the American Veterinary Medical Association 125 (932): 411-414. Nov. 1954.

Useful review of literature on hydatid (Echinococcus gramulosus) disease in wild and domestic animals in U. S., Canada, and Alaska. The author points out that on this continent hydatidosis is primarily a disease of many sorts of wild animals, and that it is relatively unusual for it to get into dog or man except in the Far North. 38 references.

Philip, Cornelius B., Gordon D. Gill, and John M. Geary. (U. S. Pub. Health Ser., Hamilton, Mont.) NOTES ON THE RABBIT TICK, HAEMAPHYSALIS LEPORIS-PALUSTRIS (PACKARD), AND TULAREMIA IN CENTRAL ALASKA. Journal of Parasitology 40 (4): 484-485. Aug. 1954.

The tick has extended its range and tularemia may appear in more areas.

MAMMALS--SHREWS, MOLES, BATS

Burns, Kenneth F., and Charles J. Farinacci. (Med. Center, Ft. Sam Houston, Texas.) RABIES IN NONSANGUIVOROUS BATS OF TEXAS. Science 120 (3118): 548. Oct. 1, 1954.

"...(i) the Mexican free-tailed bat (Tadarida mexicana) is a host for the virus of rabies in nature; and (ii) extensive inapparent infections occur in this species as evidenced by the development of neutralizing antibodies for the virus of rabies. Such immunity has been considered the result of naturally acquired inapparent infections."

DeMeules, Donald H. (6031 W. River Rd., Minneapolis, Minn.) POSSIBLE ANTI-ADRENALIN ACTION OF SHREW VENOM. Journal of Mammalogy 35 (3): 425. Aug. 1954.

Goehring, Harry H. (St. Teach. Coll., St. Cloud, Minn.) PIPISTRELLUS SUBFLAVUS OBSCURUS, MYOTIS KEENII, AND EPTESICUS FUSCUS FUSCUS HIBERNATING IN A STORM SEWER IN CENTRAL MINNESOTA. Journal of Mammalogy 35 (3): 434-435. Aug. 1954.

Sullivan, Thelma D., and others. (Texas Health Dept.) RECOVERY OF RABIES VIRUS FROM COLONIAL BATS IN TEXAS. Public Health Reports 69 (8): 766-768, map. Aug. 1954.

Two hundred colonial, insectivorous bats of 3 species were examined. Two Tadarida mexicana proved positive; 2 strains of rabies were represented. "Since the two infected bats were taken in unnatural locations, the possibility exists that the animals ill with rabies leave their colonies and seek solitude. If true, this would lessen the chances for spread of the infection... Certainly the destruction or abatement of the T. mexicana is not justified, but it does appear that the public should be warned relative to the dangers inherent in the handling of sick bats."

MAMMALS--SHREWS, MOLES, BATS--Continued

Twente, John W., Jr. HABITAT SELECTION OF CAVERN-DWELLING BATS AS ILLUSTRATED BY FOUR VESPERTILIONIDS. Ph. D. thesis, University of Michigan. 163 p. 1954. [From long abstract in Dissertation Abstracts 14 (8).]

"This is a report on studies of behavior in relation to habitat of populations of bats in gypsum caverns in south-central Kansas and northwestern Oklahoma. The species involved were Myotis velifer, Corynorhinus rafinesquei, Antrozous bunkeri, and Eptesicus fuscus."

MAMMALS--RABBITS AND PIKAS

Bowers, Glenn L. (Pa. Game Comm.) AN EVALUATION OF COTTONTAIL RABBIT MANAGEMENT IN PENNSYLVANIA. Trans. 19th N. Amer. Wildl. Conf. p. 358-367. 1954.

Study of restocking and habitat management in Pa. Several restocking trials are described. None did any real good--average recovery rate was only 4%--unless release was just prior to hunting, and then recovery rate was only 25%. Released rabbits often scatter out for miles; in some trials many remained near release site, in other trials very few did. Some rabbits homed up to 3 miles. Known dispersal distances are tabulated. In the habitat improvement experiment, 2 similar 300-acre tracts were selected. Forty acres of one tract were improved by fertilization, food planting, and increase of cover. The latter involved "cutting woodland edges, old fencerows, and other areas. The cut brush combined with the new vine, shrub and brier growth, produced good quality cover. The 17 plots of this type embraced about 26 acres." Various herbicides proved useful in controlling undesirable growth. In 3 years cottontails on improved tract had more than tripled despite heavy hunting pressure. This hunting never took more than 20% of marked rabbits. Heavier harvests could have been sustained. A chief factor limiting harvest in recent years "has been the seemingly ever-increasing tendency of cottontails to spend the daylight hours underground..." Conclusions: Restocking is not practical or successful. Habitat management works well. It is initially costly, but if well planned the maintenance should be relatively light. Chief need is to convince hunters. "...perhaps the goal of education could be attained most quickly if game departments would courageously abandon nonproductive management methods and employ those practices which foster the conditions indispensable to good game populations."

Connell, Joseph H. (MVZ, U. Calif., Berkeley.) HOME RANGE AND MOBILITY OF BRUSH RABBITS IN CALIFORNIA CHAPARRAL. Journal of Mammalogy 35 (3): 392-405, maps and graphs. Aug. 1954.

Report of 14-month live-trapping study of 40 individuals of Sylvilagus bachmani in a chaparral patch at Berkeley. Animals were marked by tatooing ear with steel pen. Most home ranges centered about 40 feet inside edge of brush, but animals ranged throughout the patch and, at least in winter, 70 feet into adjoining grassland. During dry season little use was made of grassland; animals seemed to shift deeper into brush. Average radius of ranges of males was 115 feet, of females, 69 feet. Ranges of males overlapped; those of females apparently did not. April population of the 11.5-acre area was 0.9 rabbits per acre; many individuals marked in fall and winter had disappeared. Sept. population was estimated to have been 2.3 per acre. Breeding season as judged by testes began in Feb. and peaked in April. Yet no young were trapped up to early May when trapping was suspended each year. Data are also given on survival on area, weight changes, and parasites.

McDonough, James J., and Richard L. Hames. (Mass. Div. Game.) SPECIES IDENTIFICATION OF TWO MASSACHUSETTS COTTONTAIL RABBITS. Massachusetts Division of Fisheries & Game. 4 unnumbered p., illus., mimeo. 1954?

S. transitionalis and S. floridanus mallurus: distribution in state (map); discussion and drawings of skull and pelage characters useful in identification.

Penner, Lawrence R. (U. Conn.) DIROFILARIA SCAPICEPS FROM SNOWSHOE HARE IN CONNECTICUT. Journal of Mammalogy 35 (3): 458-459. Aug. 1954.

This nematode is also known from cottontails in Conn. and Mass.

MAMMALS--RABBITS AND PIKAS--Continued

Thompson, Harry V. (Ministry of Agr., Hook Rise, Tolworth, Surbiton, Surrey, Eng.) THE RABBIT DISEASE: MYXOMATOSIS. Annals of Applied Biology 41 (2): 358-366, map. June 1954.
Natural occurrence, transmission, host specificity, early trials for Oryctolagus control, epizootics in Australia and France, outbreaks in Britain, plans for studying the disease and its host and vectors in Britain. The paper provides a good, up-to-date review of its subject.

Trefethen, Jim, and Dan Poole. (Columbia Ave. at Lindwood, Landover, Md.) RABBITS DOWN THE RAT HOLE! Virginia Wildlife 15 (8): 4-7, illus. Aug. 1954. (Reprinted from Hunting and Fishing magazine for May 1954.)
Facts and figures, popularly presented, demonstrate the futility of stocking cottontails. A few suggestions are made for improving habitat.

Trefethen, Jim, and Dan Poole. (Columbia Ave. at Lindwood, Landover, Md.) STACKING THE CARDS FOR COTTONTAILS! Hunting and Fishing 31 (7): 11-13, 46-47, illus. Aug. 1954.
Gives many good practical suggestions for sportsmen's groups that are interested in improving rabbit habitat. The authors not only tell how to restore cottontail habitat, but also tell how to get in touch with and get along with interested farmers.

Watson, J. S. (Animal Ecol. Sect., D.S.I.R., Wellington, N. Z.) BREEDING SEASON OF THE WILD RABBIT IN NEW ZEALAND. Nature 174 (4430): 608-609, graph. Sept. 25, 1954.
Breeding period of Oryctolagus cuniculus in N. Z. is compared with that in Wales.

EUROPEAN RABBIT--PARTIAL BIBLIOGRAPHY ON INTRODUCTION, CONTROL, ECONOMICS, ETC.

A. San Juan rabbits in the U. S.

Anonymous. A NEW THREAT TO AMERICAN AGRICULTURE--EUROPEAN RABBITS IN THE UNITED STATES. 1 p., mimeo. (Available from Dr. H. W. Levi, Dept. Zool., U. Wis., Madison 6.)
"San Juan rabbits," which are really European rabbits that have reverted to the wild type from domestic rabbit varieties, are being planted in various parts of the U. S. by sportsmen's groups. These rabbits are the beasts that have devastated Australia and New Zealand. They still do damage amounting to millions of pounds sterling in Britain each year. If the animal succeeds in the U. S. it certainly will be a dangerous pest. If it fails or barely manages to hang on it will not be much of a game animal. How great are the chances that it will happen to strike a happy medium? Game officials, sportsmen, and farmers are urged to oppose further introductions of this rabbit and to work for the elimination of existing colonies. The federal Lacey act made importation of European rabbits into the U. S. illegal many years ago; steps to bar interstate shipment are needed.

Anonymous. RABBITS MENACE FOOD. Science News Letter 66 (20): 310. Nov. 13, 1954.
Tells of introductions by sportsmen of European rabbits from San Juan Islands, and reviews damage and control problems these rabbits have created in other countries. The federal government has no authority to prevent interstate shipment of the pest unless Washington State makes exportation illegal. Officials of that state are quoted as feeling that the rabbits constitute no real problem and that "any state worried about the rabbit could easily place an embargo on its importation." [Such an embargo would require legislative action in many states, and such action might or might not be taken in time. Introductions into Pa. seem to be continuing on a large scale despite concern of game officials. An embargo would help a state only temporarily if adjacent states permitted wholesale plantings that resulted in establishment.]

EUROPEAN RABBIT--PARTIAL BIBLIOGRAPHY ON INTRODUCTION, CONTROL, ECONOMICS, ETC.--Continued

A. San Juan rabbits in the U. S.--Continued

Couch, Leo K. INTRODUCED EUROPEAN RABBITS IN THE SAN JUAN ISLANDS, WASHINGTON. Journal of Mammalogy 10 (4): 334-336, illus. 1929.
Origin of colony, devastation and erosion caused on islands, control efforts. A photo shows bluff crumbling after being honeycombed by burrows.

Latham, Roger M. (Pa. Game Comm.) THE SAN JUAN RABBIT. Pennsylvania Game News 25 (9): 20-25, illus. Sept. 1954.
Pa. sportsmen are stocking European rabbits (Oryctolagus cuniculus) from the San Juan Islands of Washington. The author reviews history of these rabbits on San Juan Islands, sketches their habits, and tells something of the damage they have done in the Australian region. San Juan rabbits are not known to be diseased, so Pa. allows their importation by anyone who buys a $1.00 permit. Releases in Pa. have been going on for only 2 years and little is known of the results, but some individuals are known to have survived one mild winter in the most northern counties. Foods include many native and crop plants, including some not regularly eaten by cottontails. European rabbits are not expected to cross with cottontails for they are in a different genus. The imports weigh 4-7 pounds, have larger ears and feet than do cottontails, eat much more than cottontails, and are great burrowers. Federal regulations bar importation of European rabbits from foreign countries but do not bar interstate shipment. "Research personnel are watching several of these San Juan releases closely. Within the next few years, they hope to decide whether this new game animal should be encouraged or rigidly controlled. Let us hope that this introduction will not turn out to be a biological blunder." [A wait-and-see attitude may prove dangerous. How can rabbits be exterminated after they are well enough established to be pests?]

New Jersey PURCHASE OF RABBITS. New Jersey Outdoors 5 (4): 29. Oct. 1954.
State Federation of Beagle Clubs urged propagation of San Juan rabbits. Game Division expressed desire to cooperate.

Ohio. NO HARES FOR OHIO. Ohio Conservation Bulletin 18 (8): 30. Aug. 1954.
European rabbits (Oryctolagus cuniculus) propagated on the San Juan Islands of Washington are being sold to sportsmen in different parts of the country for stocking. Some have been released in Ohio contrary to state law.

Smith, Howard. 24 x 95 YEARS = 2,000,000,000. Baltimore Sun, Section A. Sunday Nov. 21, 1954. 1 p.
European rabbits are being imported into every one of the Pa. counties that border Md. Vast numbers are being imported by hunters and hunting clubs. San Juan stock is advertised in sporting magazines and sold to anyone. Roger Latham is quoted as saying that these rabbits stand winter far better than cottontails and cause more damage to hay and oats. Pa. cannot exclude these rabbits because only health laws apply and the imports are healthy. Md. is in same situation. One Md. club has requested import permit. Wash. State officials are quoted as saying that rabbits have not hurt economy of San Juan Islands or of mainland. Under Wash. law, any commercial use can be made of these rabbits and game authorities of state will seek no change. Article also reviews history of rabbits in Australia and San Juan Islands. Author points out that rabbit burrows have undermined buildings and that rabbits may eat crops down to the soil.

Wildlife Management Institute. RELEASE OF EUROPEAN RABBITS NOT RECOMMENDED. Outdoor News Bulletin 8 (22): 3. Oct. 29, 1954.
Stocking of San Juan rabbits is discouraged. Missouri has refused to permit release of these rabbits.

EUROPEAN RABBIT--PARTIAL BIBLIOGRAPHY ON INTRODUCTION, CONTROL, ECONOMICS, ETC.--Continued

B. Economics, control, etc. in other countries.

Allen, D. L. OUR WILDLIFE LEGACY. Funk & Wagnalls, N. Y. x + 422 p., illus. 1954.
Good brief summary of rabbit troubles in Australia on pages 31-32.

Blackmore, Michael. MAMMALS IN BRITAIN. Collins, London. 1-128 p., illus. 1948.
Recent views on economics of rabbit are given on pages 77-79. Rabbit damage in Britain "is exceeded only by that of rats and mice collectively." Nature of damages is described.

Church, B. M., F. H. Jacob, and H. V. Thompson. SURVEYS OF RABBIT DAMAGE TO WHEAT IN ENGLAND AND WALES, 1950-52. Plant Pathology 2 (4): 107-112, illus. 1953.
Results of exclosure studies. About 6.5% of all winter wheat in England and Wales was lost to rabbits.

Clark, A. H. THE INVASION OF NEW ZEALAND BY PEOPLE, PLANTS, AND ANIMALS. Rutgers Univ. Press. xiv + 465 p., illus. 1949.
Pages 259-272 give good discussion of rabbits in N. Z.

Dollman, Guy. THE RABBIT MENACE. Natural History Magazine (British Museum) 5 (39): 297-311, illus. 1936.
Destructiveness in Australia and Britain.

Hume, C. W. THE RABBIT PROBLEM IN BRITAIN. Rept. Brit. Assoc. Adv. Sci. 107: 455-456. 1937. [Reference from Zoological Record.]

Lancum, F. Howard. WILD MAMMALS AND THE LAND. Ministry of Agr. and Fisheries, Bulletin 150. H.M.S.O., London. 1-60 p., illus. 1951.
Pages 19-23 give clear picture of official view of economic status and habits of Oryctolagus in Britain today.

Lockley, R. M. SOME EXPERIMENTS IN RABBIT CONTROL. Nature 145 (3681): 767-769. 1940.
Account of 12-year attempt to control or exterminate rabbits on a rocky 250-acre island.

Middleton, A. D. THE CONTROL AND EXTERMINATION OF WILD RABBITS. Bureau of Animal Population, Oxford. 27 p., illus. 1940.
Booklet on control methods.

Phillips, W. M., M. N. Stephens, and A. N. Worden. OBSERVATIONS ON THE RABBIT IN WEST WALES. Nature 169 (4308): 869-870. 1952.
Considerable information on economics, control, biology.

Ratcliffe, F. N. THE RABBIT PROBLEM--A SURVEY OF RESEARCH NEEDS AND POSSIBILITIES. Commonwealth Sci. and Indus. Research Organization, Melbourne. 17 p. 1951.
Difficulty of eradication; possible value of myxomatosis.

REPORT OF THE ADVISORY COMMITTEE ON MYXOMATOSIS. Ministry of Agr. and Fisheries; Dept. Agr. Scotland. H.M.S.O., London. iv + 14 p. 1954.
Mostly on myxomatosis, but includes statement that damage rabbits do in Britain amounts to 45 to 60 million pounds sterling per year. Extermination is recommended.

EUROPEAN RABBIT--PARTIAL BIBLIOGRAPHY ON INTRODUCTION, CONTROL, ECONOMICS, ETC. Continued

B. Economics, control, etc. in other countries.--Continued

Ritchie, James. THE INFLUENCE OF MAN ON ANIMAL LIFE IN SCOTLAND. Cambridge Univ. Press. xvi + 550 p., illus. 1920.
Pages 247-254 show how rabbit has spread over much of Scotland--an important point since some biologists are saying that since San Juan rabbits come from a mild climate they are not apt to succeed in northern states. The harsh climate of Scotland is well known. This book states at various points that rabbit is now a great pest, but gives no details on this matter, apparently considering it too well known to require comment.

Ritchie, James. BEASTS AND BIRDS AS FARM PESTS. Oliver and Boyd, Edinburgh and London. xii + 270 p., illus. 1931.
Rather general, but see pages vii, 16-20, 50-51.

St. Clair-Thompson, G. W. THE PROTECTION OF WOODLANDS. Witherby, London. 1-223 p. 1928.
Relation of rabbits to woodlands, pages 126-131 and 150-151.

Southern, H. N. THE ECOLOGY AND POPULATION DYNAMICS OF THE WILD RABBIT (ORYCTOLAGUS CUNICULUS). Annals of Applied Biology 27 (4): 509-526, illus. 1940.
Good live-trapping study of field biology in Britain.

Stead, David G. THE RABBIT IN AUSTRALIA. Winn & Co., Sydney. 108 p., illus. 1935.
Book on spread, economics, control efforts. Major work on its subject.

Stephens, Marie N. SEASONAL OBSERVATIONS ON THE WILD RABBIT (ORYCTOLAGUS CUNICULUS CUNICULUS L.) IN WEST WALES. Proc. Zool. Soc. London 122 (2): 417-434. 1952.
Important biological study, but no data on economics or control.

Thompson, H. V., and C. J. Armour. CONTROL OF THE EUROPEAN RABBIT (ORYCTOLAGUS C. CUNICULUS L.) Annals of Applied Biology 38 (2): 464-474. 1951.
Comparison of control methods.

Thompson, H. V. THE GRAZING BEHAVIOR OF THE WILD RABBIT, ORYCTOLAGUS CUNICULUS (L.). British Journal of Animal Behavior 1 (1): 16-19. 1953.
Effects on natural and cultivated vegetation, and data on various aspects of ecology.

Thompson, H. V. MYXOMATOSIS OF RABBITS. Agriculture: The Journal of the Ministry of Agr. 60: 503-508, illus. 1954.
Includes statement that Australian epizootic of 1952-53 is believed to have saved crops worth 50 million pounds sterling.

Wodzicki, K. A. INTRODUCED MAMMALS OF NEW ZEALAND. Dept. Sci. and Indust. Research Bulletin 98. x + 250 p., illus. 1950.
Full discussion of rabbit in New Zealand, pages 107-141.

MAMMALS--RODENTS--MISCELLANEOUS

Bartholomew, George A., Jr., and Grant Reynolds Cary. (U. Calif., Los Angeles.) LOCOMOTION IN POCKET MICE. Journal of Mammalogy 35 (3): 386-392, illus. Aug. 1954.

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Butsch, Robert Stearns. THE LIFE HISTORY AND ECOLOGY OF THE RED-BACKED VOLE, CLETHRIONOMYS GAPPERI GAPPERI VIGORS, IN MINNESOTA. Ph.D. thesis, University of Michigan. 161 p. 1954. [From long abstract in Dissertation Abstracts 14 (7).]

Based on live trapping, tracking in snow, and direct observation of wild and captive individuals. Centers of population density shifted yearly and corresponded to fluctuations in ground cover. Spring breeding populations consisted of young of previous year. Major activity periods were at sunrise and sunset. Temperature extremes affected time of activity. Average home range size was estimated to 0.059 acre. Adults rarely shifted home ranges. Adult females and young adult males seemed to be distributed uniformly over the study areas. High local populations appeared to be caused by extreme tolerance of adult females for younger individuals. Adult females maintained small, poorly defended territories around home sites. Adult males maintained large, vigorously defended territories. Territorial displays involving use of lateral glands are described. Homing instinct was found to be well developed and independent of age and sex. The voles were commonest in moist places that had heavy ground cover. Local distribution seemed to be controlled by availability of water rather than food.

Chiasson, Robert B. (U. Ariz.) THE PHYLOGENETIC SIGNIFICANCE OF RODENT CHEEK POUCHES. Journal of Mammalogy 35 (3): 425-427. Aug. 1954.

Church, Thomas W., Jr. MICE CAUSE SEVERE DAMAGE TO VIRGINIA PINE REPRODUCTION. U. S. Forest Service, Northeastern Forest Experiment Station (Upper Darby, Pa.), Forest Research Notes no. 35. 2 p., illus. Aug. 1954.

Microtus pennsylvanicus injured or girdled a number of young pines in an abandoned field near Beltsville, Md. The present study and an earlier, unpublished one indicate marked preference for Virginia pine over pitch pine. Quantitative data on damages are given.

Cockrum, E. Lendell. (U. Ariz.) NON-GEOGRAPHIC VARIATION IN CRANIAL MEASUREMENTS OF WILD-TAKEN PEROMYSCUS LEUCOPUS NOVEBORACENIS. Journal of Mammalogy 35 (3): 367-376. Aug. 1954.

Duncan, Donald P. (U. Minn.) A STUDY OF SOME OF THE FACTORS AFFECTING THE NATURAL REGENERATION OF TAMARACK (LARIX LARICINA) IN MINNESOTA. Ecology 35 (4): 498-521, illus. Oct. 1954.

A long, thorough report on field and laboratory studies of many factors. On pages 502-503 the author discusses seed destruction by birds and small mammals. Two to 4 times as many seedlings became established in rodent exclosures as in unprotected plots. Rodent reduction to aid tamarack reproduction may be desirable under some circumstances.

Kennerly, Thomas E., Jr. (U. Texas.) LOCAL DIFFERENTIATION IN THE POCKET GOPHER (GEOMYS PERSONATUS) IN SOUTHERN TEXAS. Texas Journal of Science 6 (3): 297-329, map and graphs. Sept. 1954.

Statistical analysis of variation in external and skeletal measurements; correlation of soil and pelage colors; relation of soil type and burrows; discussion of geographic variation.

Manning, T. H. (37 Linden Terrace, Ottawa, Canada.) REMARKS ON THE REPRODUCTION, SEX RATIO, AND LIFE EXPECTANCY OF THE VARYING LEMMING, DICROSTONYX GROENLANDICUS, IN NATURE AND CAPTIVITY. Arctic 7 (1): 36-48. June 1954.

Age at sexual maturity, litter size at birth and later, effect of mother's age on litter size, numbers of embryos and nestlings, litter size in wild and captive lemmings, gestation period, litter frequency, sex ratios, care of young, life expectancy, and disease.

Morrison, Peter R., Fred A. Ryser, and Robert L. Strecker. (U. Wis.) GROWTH AND DEVELOPMENT OF TEMPERATURE REGULATION IN THE TUNDRA REDBACK VOLE. Journal of Mammalogy 35 (3): 376-386, graphs. Aug. 1954.

MAMMALS--RODENTS--MISCELLANEOUS--Continued

Pruitt, William O., Jr. (Arctic Aeromedical Lab., Fairbanks, Alaska.) NOTES ON COLORADO PHENACOMYS AND PIKAS. Journal of Mammalogy 35 (3): 450-452. Aug. 1954.
Phenacomys intermedius: Habitat, reproduction, measurements. Ochotona princeps: Habitat, how to collect by shooting, how to collect by live trapping, food and drinking habits of captives, intergradation between races saxatilis and figginsi.

Rinker, George C. (U. Mich.) THE COMPARATIVE MYOLOGY OF THE MAMMALIAN GENERA SIGMODON, ORYZOMYS, NEOTOMA, AND PEROMYSCUS (CRICETINAE), WITH REMARKS ON THEIR INTERGENERIC RELATIONSHIPS. University of Michigan, Museum of Zoology, Miscellaneous Publications no. 83. 124 p., illus. 1954. $1.25.

Shadle, Albert R. (U. Buffalo.) THE WELL-ARMED PORCUPINE. Animal Kingdom 57 (5): 130-137, illus. Oct. 1954.
Exceptionally thorough popular account of porcupine natural history.

Sharp, Ward M., and Jess W. Malcolm. (Pa. St. U.) NUTS TO WILDLIFE. Pennsylvania Game News 25 (11): 41-43, illus. Nov. 1954.
Text and photos give good idea of how to tell what kind of Pa. rodent ate various kinds of nuts. Squirrels, for example, do not open acorns as do wood mice. Based on work with caged animals.

Smith, Charles F. (Res. Labs., Swift & Co., Chicago, Ill.) FOUR NEW SPECIES OF CESTODES OF RODENTS FROM THE HIGH PLAINS, CENTRAL AND SOUTHERN ROCKIES AND NOTES ON CATENOTAENIA DENDRITICA. Journal of Parasitology 40 (3): 245-254, illus. June 1954.
From Thomomys, Sigmodon, Peromyscus, and Lagurus.

Symposium. SYMPOSIUM ON RODENT CONTROL RESEARCH IN THE DIRECT SEEDING OF FOREST AND RANGE LANDS. Journal of Forestry 52 (11): 824-831. Nov. 1954.
Set of 6 short papers that describe the difficulty of reseeding, tell how seed protectants are evaluated, and give glowing accounts of successes achieved with tetramine-treated seeds. Tetramine is so exceedingly toxic to people, however, that it is no longer available and all or most work with it has been stopped. Papers of this symposium may therefore be listed by title only. Rodents and direct seeding, by D. A. Spencer, US F&WS, Denver 2, Colo. Development of better seed protectants, by N. B. Kverno, US F&WS, Denver 2, Colo. Direct seeding in the Pacific Northwest, by E. W. Shaw, Puget Sound Research Center, Olympia, Wash. The use of tetramine in bitterbrush revegetation, by R. L. Casebeer, Idaho Game Dept. Ponderosa pine seeding in the Black Hills, by W. H. Harmon, U. S. Forest Service, Custer, S. D.

Trousdell, Kenneth B. PEAK POPULATION OF SEED-EATING RODENTS AND SHREWS OCCURS 1 YEAR AFTER LOBLOLLY STANDS ARE CUT. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Research Notes no. 68. 2 p. Oct. 1954.
Trapping near Franklin, Va. revealed that small mammal populations were low in old pine stands, were high in a 1-year stand, and gradually diminished in stands of 2, 3, and 4 years. Difficulty of reforestation by seeding increased for several years, unlike small mammal populations. "It is evident that under conditions represented by this study seed-eating mammals are not primarily responsible for the increasing difficulty of getting seedlings established several years after harvest cutting."

MAMMALS--RATTUS AND MUS

Crucillo, Cornelio V., Faustino Q. Otanes, and Jose L. Morales. (Bureau of Plant Industry, P. I.) WHAT WE 'RE DOING TO CONTROL FIELD RATS IN COTABATO, PHILIPPINE ISLANDS. Pest Control 22 (11): 10, 12, 14, 16, illus. Nov. 1954.
Second of 2 articles (first in preceding issue; not reviewed). Extremely severe outbreaks of Rattus caused almost complete loss of field crops such as corn and rice. Data are given on losses and on control methods proposed and used. Cheapest and most effective control seems to have been aerial distribution of 1080-treated corn. Costs of various methods are tabulated.

Logan, Rowland Elizabeth. INFLUENCES OF ENVIRONMENTAL LIGHTING CONDITIONS ON THE ESTROUS CYCLE OF THE RAT. Ph.D. thesis, Northwestern University. 162 p. 1954. [From long abstract in Dissertation Abstracts 14 (10).]

Shuyler, Harlan Reynold. THE DEVELOPMENT OF BAITS FOR RATTUS NORVEGICUS, WITH SPECIAL REFERENCE TO INITIAL ACCEPTABILITY. Ph.D thesis, Purdue University. 594 p. 1954. [From long abstract in Dissertation Abstracts 14 (10).]
Author tested acceptability to penned rats of 274 baits or bait mixtures. The abstract cited describes several of the best baits as judged when free from poison, and when treated with red squill extract. Author believes that application of his findings should result in better rat control.

MAMMALS--SCIURIDS

Allan, Philip F., and Ben Osborn. (U. S. Soil Cons. Service, Ithaca, N. Y.) TALL GRASS DEFEATS PRAIRIE DOGS. Soil Conservation 20 (5): 103-105, 113, illus. Dec. 1954.
Semitechnical account of studies at Wichita Refuge, Okla. It was found that prairie dogs thrived on overgrazed range and gradually disappeared as tall grasses came back. Colonies reduced by poisoning thrived and spread better than an undisturbed colony, because the undisturbed colony used up all vegetation of suitable types within foraging distance of burrows. Technical account of this work appeared in July 1949 issue of Ecology.

Barkalow, Frederick S., Jr. (N. C. St. Coll.) THE STATUS OF THE NAMES SCIURUS NIGER CINEREUS LINNAEUS AND SCIURUS NIGER VULPINUS GMELIN. Journal of Elisha Mitchell Scientific Society 70 (1): 19-26, illus. June 1954.
The great gray fox squirrel of Eastern Maryland should be known as S. n. cinereus. The form now known as S. n. vicinus should be called S. n. vulpinus.

Hibbard, Ed. (N. D. Game Dept.) FOX AND GRAY SQUIRRELS. North Dakota Outdoors 17 (1): 4-5, maps. July 1954.
Valuable paper on distribution, history, and habitats in N. D. Both species now have substantial ranges in the state, as spot maps show.

Hoover, Robert L. (Colo. Game Dept.) SEVEN FETUSES IN WESTERN FOX SQUIRREL (SCIURUS NIGER RUFIVENTER). Journal of Mammalogy 35 (3): 447-448. Aug. 1954.
Reviews previous reports of litter size and reports one set of 7 embryos and average litter size of 3.83 in Colo.

Kidd, Joseph B. (320 St. Phillip St., Baton Rouge, La.) THE FOX AND GREY SQUIRRELS OF LOUISIANA. Louisiana Conservationist 7 (1): 2-5, illus. Oct. 1954.
Ranges and color phases of the La. subspecies of each species (maps and photos); brief review of habits.

Layne, James N. (So. Ill. U.) THE OS CLITORIDIS OF SOME NORTH AMERICAN SCIURIDAE. Journal of Mammalogy 35 (3): 357-366, illus. Aug. 1954.

MAMMALS—SCIURIDS—Continued

Ludeman, John. (US F&WS, 59 Temple Place, Boston 11, Mass.) BEFORE YOU CONTROL TREE SQUIRRELS AND CHIPMUNKS CHECK STATE AND LOCAL REGULATIONS. Pest Control 22 (9): 16, 18, 20, 22, 50, illus. Sept. 1954.
Notes on habits and instructions for control by physical and chemical repellents, trapping, shooting, and poisoning.

Mayer, William V. (U. So. Calif.) SOME ASPECTS OF THE ECOLOGY OF THE BARROW GROUND SQUIRREL, CITELLUS PARRYI BARROWENSIS. In Wiggins, I. L., editor, Current Biological Research in the Alaskan Arctic. Stanford University Publications, University Series, Biological Sciences 11 (1): 48-55. 1953.
Habitat, activities, seasonal behavior, burrows, growth and development, foods. Rapid development and utilization of long days allow these animals to compress most of their life activities into a 4-month period each year. Storage of food and an omnivorous diet also help.

Moore, Joseph Curtis. (Everglades Nat. Park, Homestead, Fla.) FOX SQUIRREL RECEPTIONISTS. Everglades Natural History 2 (3): 152-160, illus. Sept. 1954.
Summary of what is known about S. n. avicennia, the fox squirrel of South Fla. Emphasis is on present distribution of this scarce form. Several photographs by R. S. Palmer.

Moran, Richard J. (So. Ill. U.) TRAPPING AND MARKING SQUIRRELS ON A REFUGE IN SOUTHERN ILLINOIS. Illinois Academy of Science Transactions 46: 258-262. 1953.
One of the reports on a 2-year study (see WR 73: 36 and WR 77: 27). Some ear tags were lost, but toe bands almost always caused amputation of marked toes although applied loosely. Fox and gray squirrels were present in nearly equal numbers. Sex and age ratios appeared to vary with time of year. In Oct.-Dec. 1952, 61% of grays and 55% of fox squirrels were young. Peaks of activity were in fall and spring. Distances traveled varied from 0 to ½ mile. Figures show that fox squirrels ranged farther than grays and that adult males ranged farther than adult females. No indication of territoriality was observed. Three young traveled ¼-½ mile to other woodlots; 1 returned. Prehunting populations of 2 woodlots were estimated by Lincoln Index to be 4.6 and 7.2 squirrels per acre. Hunting kill constituted 14% and 10% of estimated populations.

Moran, Richard. A STUDY OF A REFUGE POPULATION OF THE SOUTHERN GRAY SQUIRREL, SCIURUS CAROLINENSIS CAROLINENSIS GMELIN, AND WESTERN FOX SQUIRREL, SCIURUS NIGER RUFIVENTER (GEOFFROY), IN SOUTHERN ILLINOIS. M. S. thesis, Southern Illinois University. 76 p. June 1953.--W. D. Klimstra.
See WR 73: 36 and 77: 27.

Redmond, Howard R. (Miss. Game Comm.) SQUIRREL HUNTERS' SUCCESS. Mississippi Game and Fish 18 (3): 8-9, illus. Oct. 1954.
Miss. squirrel hunting statistics (tabulated) for 1949-53 are discussed in connection with mast crops and biologically sound timing of hunting season. Hunting success is said to correlate directly with mast crop of the same year. During the 5-year period, percentage of nonbreeding females that were shot varied from 42% to 80%, averaging 62.8%. The author believes that the average Miss. squirrel kill could be increased from about 2½ million to about 3 million if the season were timed to give better protection to breeding females. Possible effect of mast crop on squirrel population of the next year is not discussed.

Uhlig, Hans. (W. Va. Cons. Comm.) OUR NUMBER ONE TARGET. West Virginia Conservation 18 (7): 24-26 + back cover. Sept. 1954.
Presents circular graph, the "wheel of life," showing biology of gray squirrel throughout year in W. Va. Text reviews life history as determined by author. In Oct., 60-70% of squirrels are young of year. Spring litter outnumbered summer litter in bag only once in 5 years; summer litter is therefore considered more important to hunter. Proper time of opening season is discussed, with conclusion that Oct. 1 is good compromise. An even later date would be good in respect to peak activity period and number of young available. On Sept. 15, at least 1/3 of the young would not be out of nests.

MAMMALS--SCIURIDS--Continued

Yeager, Lee. (Colo. A & M Coll.) BUSHYTAILS--BEYOND THE LAW. Virginia Wildlife 15 (9): 5-7, 12, 24, illus. Sept. 1954.
Popular article on hunting practices that are favorable or unfavorable to squirrel populations. Hunters will kill fewer breeding females if they avoid shooting squirrels occupying prominent den trees, and if they shoot the last rather than the first squirrel in a mating chase. Sport rather than large bags should be the aim. Sure-kill shots are desirable to avoid crippling. The author prefers head shots made with .22 equipped with scope sight. Shooting into leaf nests is poor practice. Cutting down den trees to get squirrels is even worse. "I guess it's more or less up to us hunters. They are our squirrels. We've got to think beyond the law, for no game regulation makes you draw a dead-certain bead, or leave the best squirrel factories in the woods."

MAMMALS--BEAVER

Anonymous. BRINGING BACK THE BEAVER TO SASKATCHEWAN. Oryx 1 (5): 244-245. 1952. [From Polar Record 7 (48).]
"Success of 1946 government conservation scheme."

Cook, Arthur H. (N. Y. Cons. Dept., Cornell U.) SOME MEASUREMENTS FROM A THREE AND ONE-HALF YEAR OLD BEAVER (CASTOR CANADENSIS). Journal of Mammalogy 35 (3): 452. Aug. 1954.
Numerous weights and measurements of both internal and external structures.

Hitchcock, Harold B. (Middlebury Coll.) FELLED TREE KILLS BEAVER. Journal of Mammalogy 35 (3): 452. Aug. 1954.

Lawrence, William Hobart. MICHIGAN BEAVER POPULATIONS AS INFLUENCED BY FIRE AND LOGGING. Ph.D. thesis, University of Michigan. 232 p. 1954. [From long abstract in Dissertation Abstracts 14 (7).]
Fire, windthrow, and lumbering produce conditions favorable to beaver. Peak numbers of beaver follow widespread disturbances that set back forest succession. Beavers are primarily creatures of the aspen stage. Present beaver populations can persist only as long as aspen remains available within about 5 chains from water's edge. Management should not aim to halt succession at a desired stage, but to integrate beaver management into a forest management program similar in pattern to environmental change that occurs naturally in the aspen-conifer cycle. Management should be on a streamwise basis, with some streams producing beavers while others are recovering from beaver occupancy.

Whitelaw, C. J., and E. T. Pengelley. (Dept. Lands and Forests, Toronto, Ont.) A METHOD FOR HANDLING LIVE BEAVER. Journal of Wildlife Management 18 (4): 533-534, illus. Oct. 1954.
Structure and use of a canvas holding bag that has handle, rim, and a set of drawstrings spaced along its length.

Yeager, Lee E., and Ralph R. Hill. (Colo. A & M Coll.) BEAVER MANAGEMENT PROBLEMS ON WESTERN PUBLIC LANDS. Trans. 19th N. Amer. Wildl. Conf. p. 462-478, illus. 1954.
The increasing numbers of beavers are being harvested to varying degrees on western public lands, and in Colo., with which this article is chiefly concerned, they are not harvested at all on such lands. Consequences of resultant over-populations are considered from many viewpoints. Relationship of beavers to stream flow, erosion, trout, wildlife, livestock, timber, and recreation are discussed thoughtfully. In general, beavers are an asset on most western public lands while the colonies last. But all too often beavers, sometimes complemented by livestock or big game, exhaust their food supplies and colony sites are abandoned. Dams wash out, serious erosion occurs, water levels drop, fish and game habitat is lost. "...the beaver's place, often complex, is governed by population stability, attained by holding numbers to the carrying capacity of the range. Such stability, or sustained yield, is most practically achieved through systematic and controlled harvest."

MAMMALS--MUSKRAT AND NUTRIA

Errington, Paul L. (Iowa St. Coll.) THE SPECIAL RESPONSIVENESS OF MINKS TO EPIZOOTICS IN MUSKRAT POPULATIONS. Ecological Monographs 24 (4): 377-393. Oct. 1954.

Errington has studied various populations of muskrats in Iowa for 2 decades. He can recognize many factors that disturb their welfare: drought, hard freezes, social strife, hemorrhagic disease and varying degrees of resistance to it, psychological and physiological changes that are associated with cyclic trends, and other factors. Even local foci of disease ("hotspots") are recognized. In this paper, the author's understanding of these matters is applied to interpretation of representation of muskrats of various ages in thousands of mink scats. This is possible partly because scats are usually dropped near feeding sites. Most of the paper is devoted to detailed interpretations of why groups of scats had the representation of muskrat that they did. The paper contains much related information on mink and muskrat biology, especially on hemorrhagic disease and differential response of muskrats to it. The basic conclusion is that sound, well-adjusted muskrat populations are almost immune to mink predation. Minks take exposed and wandering individuals, and they eat sick and dead ones. They know hotspots of disease and work them thoroughly. Much previously puzzling predation of minks on muskrats can be explained by hemorrhagic disease. Raccoons also were found to concentrate on disease areas and their work there often resembled plain predation. In this connection the author mentions (p. 381) the great amount of raccoon predation on muskrats found on the Atlantic Coast by Harris and Wilson.

Mathiak, Harold A., and Arlyn F. Linde. (Wis. Cons. Dept.) ROLE OF REFUGES IN MUSKRAT MANAGEMENT. Wisconsin Conservation Department, Technical Wildlife Bulletin no. 10. 1-16 p., map. 1954.

A 95-acre unit of excellent habitat centrally located in Horicon Marsh was closed to trapping for 2 years. From 1949-51, 409 kits were ear-tagged in this unit. Travels away from the refuge were so few that restocking values were far less than the loss from failure to harvest in the refuge. The refuge failed to build up the muskrat population in it. It did cause great loss from unharvested pelts. Recoveries of kits tagged in refuge were much lower than recoveries of kits tagged in other units. Second-year recoveries of kits tagged on refuge were practically equal to those of kits tagged in rest of marsh. Survival rates after first winter therefore seemed to be independent of trapping pressure. Life span of muskrat is short: no muskrat as much as 3 years old was found although 4,158 were tagged as kits. Authors conclude that refuges for muskrats are undesirable, except that small ones located in good areas for winter survival may be of value where trapping pressure is excessive.

Seymour, George D. (Calif. Dept. Game.) RECENT EXTENSION OF THE RANGE OF MUSKRATS IN CALIFORNIA. California Fish and Game 40 (4): 375-384, illus. Oct. 1954.

Favored by rice culture and pasture irrigation, and aided by unofficial transplanting, muskrats have spread over much of the Central Valley in the last 15 years. They do little crop damage and feed largely on cattail, an abundant weed of ditches. In light soils like those of the Imperial Valley they do considerable damage to canal banks and levees, but in heavy soils like those of the Sacramento Valley they do little harm. Much damage to water-control structures was blamed on muskrats but proved to be work of Rattus norvegicus. Data are given on history, distribution, and spread of muskrats in Calif. Detailed information is given on pelt harvests, 1939-52. The 1952-53 catch of 83,053 muskrats was valued at $83,000 which was 79% of value of all furs taken in state.

MAMMALS—FURBEARERS—GENERAL

Anonymous. COMPARATIVE FUR CATCHES IN WASHINGTON. Washington State, Game Bulletin 6 (4): 5. Oct. 1954.
Catches of 9 species, 1949-54; pelt prices of 4 species in 1953-54.

Ashbrook, Frank G. ABSTRACT OF FUR LAWS, 1954-55. U. S. Fish & Wildlife Service, Wildlife Leaflet 363. 1-39 p. Oct. 1954.
Summaries of fur laws of states, provinces, and territories of North America.

Ashbrook, Frank G. (US F&WS.) FURS GLAMOROUS AND PRACTICAL / FUR BUYING MYSTERY REMOVED. D. Van Nostrand Co., N. Y. xiv + 88 p., illus. 1954. $2.95.
Although written primarily as a guide for fur purchasers, retailers, and home economists, this interesting nontechnical book has some information of real reference value for biologists. Of particular value is chapter 7, "A Consumer's Guide To Furs," which consists of a 12-page table that shows origin, characteristics, uses, and relative serviceability of 104 kinds of furs from all over world. Several chapters and their photographs give a good popular account of the history of fur, how furs are processed and marketed, and how fur garments are made. Other chapters tell how to select a fur coat, how to care for fur products, and how to guard against misrepresentation. One chapter, "Tips For Those Who Sell," emphasizes the need of providing full and accurate information. There are also a glossary of terms used in the fur trade and a selected bibliography. The book has been endorsed by a number of fur companies and associations.

Kennamer, Earl F. (Ala. Extension Service, Auburn.) SIZE AND VALUE OF ALABAMA FUR CROP. Journal of Wildlife Management 18 (4): 539. Oct. 1954.
Data for 1950-51. Total value was $411,114. Size of catch is stated for each fur species. Prices obtained varied with buyer. Best prices were obtained through N. Y. Auction Co. Most trappers were farmers. Average fur income per trapper was $124.58.

Wood, John E. (Texas A & M Coll.) FOOD HABITS OF FURBEARERS OF THE UPLAND POST OAK REGION IN TEXAS. Journal of Mammalogy 35 (3): 406-415. Aug. 1954.
Foods of raccoon, opossum, gray fox, striped skunk, and ringtail are discussed quantitatively. Representation of foods is related to availability, with availability indicated by five classes of abundance. Relative reliability of contents of stomach, gut, and scats are compared. For related paper based on same study see WR 71: 22.

MAMMALS—BEARS

California. BEAR DEPREDATION. Report of Subcommittee on Public Lands, Grazing and Forest Practices of Assembly Interim Committee on Agriculture. Assembly Interim Committee Reports 1953-1955, vol. 17, no. 1. 1-58 p., illus. March 1954. (Available from Assembly of State of Calif., Sacramento.)
Incorporates detailed reports and expressions of opinion from many individuals and organizations on bear damage to trees, livestock, and other crops. Fred A. Clover and E. E. Hansen present a detailed study of damage to tree stands and recommend intensive control. The Hammond Lumber Co., a main sufferer, supplies much related information on significance of losses. Representatives of livestock growers present strong statements of their losses and lack of satisfaction with official actions and attitudes. Other findings and opinions are included. It is apparent that damage to forest stands is serious in some areas, and that some interests are pressing for general bear control. The subcommittee recommends that the Fish and Game Commission be empowered to declare the bear a predator in any district or part of district, and that 3 departments of the state be "authorized to take such steps as may be necessary to cause bears to be taken in those districts or parts of districts..." This publication is recommended to all those interested in bear damage to forest stands or in problems of bear conservation.

MAMMALS--BEARS--Continued

Chase, Greenleaf. (N. Y. Cons. Dept.) BEAR FACTS (2). New York State Conservationist 9 (2): 2. Oct.-Nov. 1954.
The situation described earlier (see WR 75: 38) has become worse. Bears are too abundant in the Adirondacks and in some places they have become semi-domesticated by garbage dumps. They raid numerous camps and kill livestock. They are now troublesome through much of the year. The bear is a fine game animal and should be treated like one. It should not be controlled as a nuisance by professionals, as is the rat. Adequate hunting pressure is needed and the best way to get it is through longer and--most important--earlier seasons.

Elton, C. S. (Bur. Animal Population, Oxford, Eng.) FURTHER EVIDENCE ABOUT THE BARREN-GROUND GRIZZLY BEAR IN NORTHEAST LABRADOR AND QUEBEC. Journal of Mammalogy 35 (3): 345-357, map. Aug. 1954.
Summary: "Reports from natives, fur-traders and explorers about the existence of a species of large bear of the grizzly type in north-eastern Labrador and Quebec are supported by evidence from early fur returns of the Hudson's Bay Company and the Moravian Missions. It is concluded that a species different from Ursus americanus existed and may still exist in that region, and that it is probably the barren-ground grizzly bear (Ursus richardsoni), hitherto known only for certain from country west of Hudson Bay. It is also confirmed that the brown or cinnamon phase of Ursus americanus is extremely rare in Quebec Peninsula."

Rausch, Robert. (Arctic Health Res. Center, Anchorage, Alaska.) STUDIES ON THE HELMINTH FAUNA OF ALASKA. XXI. TAXONOMY, MORPHOLOGICAL VARIATION, AND ECOLOGY OF DIPHYLLOBOTHRIUM URSI N. SP. PROVIS. ON KODIAK ISLAND. Journal of Parasitology 40 (5): 540-563, illus. Oct. 1954.

Toner, G. C. (Highland Grove, Ont.) THE BEAR INVASION OF 1953. Federation of Ontario Naturalists, Bulletin no. 64: 3, 27, illus. Spring 1954.
"The year 1953 was the Year of the Bear. From Quebec City to Fort William, and beyond, they swarmed out of the bush and came south. Orchards were their favorite feeding grounds. They climbed the trees in their search for fruit and broke quite large branches. Appreciable numbers of pigs, lambs and other young stock disappeared and the bears were blamed. ...this year their hunger seemed to overcome their natural caution. Whether or not bears exhibit cyclic phenomena in their numbers seems to be undecided. The farmers in this region maintain that they are very plentiful every ten or eleven years and are hardly ever seen in the intervals." Many zoologists disagree. "The next decade should prove or disprove this theory of abundance and scarcity."

MAMMALS--RACCOON AND RINGTAIL

CORRECTIONS. In the entry for G. P. Dellinger's thesis on raccoons (WR 77: 31), please make the following changes. In line 6 (third line of abstract) delete the words "lack of." To end of line 13 add word "adult." In line 18 change "do not" to "may not." Each of these changes alters the meaning significantly.

Butterfield, Robert T. (Box 670, Buckhannon, W. Va.) SOME RACCOON AND GROUNDHOG RELATIONSHIPS. Journal of Wildlife Management 18 (4): 433-437. Oct. 1954.
Study of use of ground dens and artificial tree dens in Ohio. Author's summary: "1. It appears that groundhogs and raccoon often use the same hole as a refuge site, as a den, and even perhaps as a brood den. 2. Den trees may not be necessary to maintain a high raccoon population if an adequate supply of ground dens are present. 3. In one case observed, a groundhog took the worst of a fight with a raccoon."

Butterfield, Robert T. (Box 670, Buckhannon, W. Va.) TRAPS, LIVE-TRAPPING, AND MARKING OF RACCOONS. Journal of Mammalogy 35 (3): 440-442, illus. Aug. 1954.
Describes suitable trap, trapping methods, handling cone, ear tagging.

MAMMALS--RACCOON AND RINGTAIL--Continued

Haugen, Orland L. (Mich. Dept. Cons., Allegan, Mich.) LONGEVITY OF THE RACCOON IN THE WILD. Journal of Mammalogy 35 (3): 439. Aug. 1954.
Shot 12 years and 1 month after first capture and within ½-mile of site of first capture. Probable age: 12 years and 7 months.

Llewellyn, Leonard M., and Robert K. Enders. (Patuxent Refuge, Laurel, Md.) OVULATION IN THE RACCOON. Journal of Mammalogy 35 (3): 440. Aug. 1954.
Evidence that ovulation is induced by copulation. Authors suggest that this mode of ovulation might aid in recovery from population lows.

Llewellyn, Leonard M., and Robert K. Enders. (Patuxent Refuge, Laurel, Md.) TRANS-UTERINE MIGRATION IN THE RACCOON. Journal of Mammalogy 35 (3): 439. Aug. 1954.

Penner, Lawrence R. (U. Conn.) A NOTE ON MACRACANTHORHYNCHUS INGENS IN A CONNECTICUT RACCOON. Journal of Mammalogy 35 (3): 459. Aug. 1954.
This worm may have entered Conn. with raccoons imported for stocking.

Reilly, James R. (N. Y. Cons. Dept.) THE RACCOON AS A WILDLIFE RESERVOIR OF LEPTOSPIRA CANICOLA. New York Fish and Game Journal 1 (2): 220. July 1954.
Four N. Y. raccoons gave positive agglutination tests for this disease. Many other raccoons that were sick or of odd behavior apparently were suspected of having it. The disease affects dogs and sometimes people.

MAMMALS--MUSTELIDS

Anonymous. WEASELS AND THEIR CONTROL. U. S. Fish & Wildlife Service, Wildlife Leaflet 360. 1 p. July 1954.
The Service is revising control leaflets (correspondence aids) and issuing them as Wildlife Leaflets for the sake of having them in a numbered series. Wildlife Leaflets are now regarded as correspondence aids rather than publications. The present one takes up characteristics of weasels and how to trap troublesome individuals.

Cahalane, Victor H. (Nat. Park Service.) STATUS OF THE BLACK-FOOTED FERRET. Journal of Mammalogy 35 (3): 418-424, map. Aug. 1954.
Numerous recent records, most of them not published before, are compiled and mapped. Ferrets do eat animals other than prairie dogs, but the association of ferrets with prairie dog colonies is shown to be close. Since the ferret is one of our rarest animals, its ecological requirements should be studied. Attempts are under way to have ferrets live trapped and moved to suitable sanctuaries in national parks from prairie dog colonies that are to be controlled.

Macy, Ralph W., and Donald J. Moore. (Reed Coll.) ON THE LIFE CYCLE AND TAXONOMIC RELATIONS OF CEPHALOPHALLUS OBSCURUS N.G., N. SP., AN INTESTINAL TREMATODE (LECITHODENDRIIDAE) OF MINK. Journal of Parasitology 40 (3): 328-335, illus. June 1954.

Newby, Fletcher E., and Vernon D. Hawley. (Mont. Game Dept.) PROGRESS ON A MARTEN LIVE-TRAPPING STUDY. Trans. 19th N. Amer. Wildl. Conf. p. 452-460, illus. 1954.
From authors' summary: "Progress is reported for a marten live-trapping study conducted in Glacier National Park. Methods used in trapping, handling, marking, and age and sex determination are described. Data on trapping success and trap mortality are presented and evaluated. Weights are analyzed with reference to disparity of the sexes, seasonal variation and frequency of capture. Age composition of the captured animals is given by two classes--juveniles and yearlings or older. The preponderance of males in captures in the present study is compared with similar information from the literature. Data which imply an even sex ratio in resident animals are presented. Evidence of well established foraging areas is pointed out. Apparent differences in range correlated with sex are indicated by greater minimum foraging areas and frequency of recapture of males. Minimum daily movements of an adult male marten are calculated from captures on successive days at various times throughout the year."

MAMMALS--MUSTELIDS--Continued

Sanderson, Glen C. (Iowa Cons. Comm.) RECENT RECORDS OF THE OTTER IN IOWA. Iowa Conservationist 13 (7): 52, 55. July 1954.

MAMMALS--DOGS, WOLVES, FOXES

Butler, Joseph Miles, and Albert W. Grundmann. (U. Utah.) THE INTESTINAL HELMINTHS OF THE COYOTE CANIS LATRANS SAY, IN UTAH. Journal of Parasitology 40 (4): 440-443. Aug. 1954.

Merwe, N. J. van der. (Prov. Game Farm, Panfontein, Bloemhof, Transvaal.) THE COYOTE AND THE BLACK-BACKED JACKAL / A COMPARISON OF CERTAIN SIMILAR CHARACTERISTICS. Fauna & Flora no. 3, p. 45-51, illus. 1953. [Available from Controller of Provincial Stores, P. O. Box 857, Pretoria.]
Information from numerous American references is used to show a marked parallelism in habits and behavior. In English and Afrikaans.

Merwe, N. J. van der. (Prov. Game Farm, Panfontein, Bloemhof, Transvaal.) THE JACKAL. Fauna & Flora no. 4, p. 2-77, illus. 1953. [Available from Controller of Provincial Stores, P. O. Box 857, Pretoria.]
Monograph on the black-backed jackal, an African dog similar in many ways to the coyote. Many aspects of habits and biology are discussed. Control methods are considered at length. One chapter is devoted to biology and economics of other South African canids. In English.

Wood, John Eugene. (Johns Hopkins Univ., Baltimore.) INVESTIGATION OF FOX POPULATIONS AND SYLVATIC RABIES IN THE SOUTHEAST. Trans. 19th N. Amer. Wildl. Conf. p. 131-139. 1954.
Introductory sections give data on recent incidence of rabies in wild animals in Ga. and Fla. and tell of value of trapping programs in relieving epizootic areas and slowing spread of rabies. Author then describes his own work in sampling fox populations. Standardized trap lines with traps 0.2 mile apart were placed along unimproved roads. It is thought that on the average such a line will sample a strip a mile wide. Of these lines, 81.8% caught all the foxes that they were going to catch on or before the 7th day. "An average of 5.3 days was required to trap all of the trappable foxes on the 19 lines which produced foxes." A "density-contact index" was derived from number caught and length of line. Present "limited data suggest that a population represented by a density-contact index of 4.1 is sufficiently high to allow an epizootic whereas populations represented by indices of 1.6, 1.5, and 1.0 have a contact rate too low to support an epizootic."

MAMMALS--CATS

Anonymous. OLD BOB: IOWA'S WILD GHOST. Iowa Conservationist 13 (9): 65, 70, illus. Sept. 1954.
Bobcats are not extinct in Iowa. Several recent records are cited. "...bobcats prefer rocky, wooded areas like those in eastern and northeastern Iowa. These include the wildest places in the state and rugged valleys that are seldom, if ever, hunted by man."

Penner, Lawrence R., and Wesley N. Parke. (U. Conn.) NOTOEDRIC MANGE IN THE BOBCAT, LYNX RUFUS. Journal of Mammalogy 35 (3): 458. Aug. 1954.
Description of case from Conn. The disease is fairly common and often fatal in foxes and house cats in Conn.

MAMMALS--BIG GAME--GENERAL

Hickie, Paul, compiler. (US F&WS, Denver 2, Colo.) INVENTORY OF BIG-GAME ANIMALS OF THE UNITED STATES. U. S. Fish & Wildlife Service, Wildlife Leaflet 364. 1-3 p. Sept. 1954.
Tabular report for 1953. As usual, data submitted by all states are tabulated by state and by type of game, with species, state, and national totals. Figures mostly are estimates, of course, but it is extremely useful to know approximately how many animals of a given kind there are in a certain state, and about what the latest kill was. Comparisons between species and between states are easily made. Wild turkey and 4 kinds of exotic artiodactyls are included in the table. [The first run of this leaflet erroneously gave the table for 1952 rather than 1953. Correct copies of WL 364 have "1953" in the heading of the table and "August 9, 1954" below lower left corner of table.]

Hoskins, Leonard W. BROWSE UTILIZATION STUDIES ON THE POCATELLO WINTER BIG GAME RANGE. M.S. thesis, University of Idaho. 85 p. 1952.

McCulloch, Clay Y., Jr. A PRELIMINARY STUDY OF THE UPPER SELWAY RIVER BIG GAME WINTER RANGE WITH SPECIAL REFERENCE TO BROWSE UTILIZATION. M.S. thesis, University of Idaho. 107 p. 1952.
Publication: "Wilderness big game problems," The Idaho Sportsman 1 (10): 12, 32-33. 1953.

MAMMALS--HOOFED (Except deer)

Berner, Lester M. (S. D. Dept. Game.) ANTELOPE SEASONS PAST AND PRESENT. South Dakota Conservation Digest 21 (8): 2-3. Aug. 1954.
Brief account of history of pronghorns in S. D., how number of permits is decided on, and table of take 1942-53.

Brown, Ellsworth R., and Charles F. Martensen. (Wash. Dept. Game.) TECHNIQUES AND RESULTS OF ELK TRAPPING AND TAGGING IN YAKIMA COUNTY, WASHINGTON. Washington State, Game Bulletin 6 (3): 5, 8-9, 12, illus. July 1954.
Discusses problems with tags and reports movements of individuals. "It can be concluded from tag returns that the Yakima elk herd is not one large herd migrating freely over the area as was once thought. Rather, it seems there are many small herds, each with a definite migration route, and each herd returning to the same general winter range areas each year."

Buckley, John L., David L. Spencer, and Paul Adams. (U. Alaska.) MUSKOX (OVIBOS MOSCHATUS) LONGEVITY. Journal of Mammalogy 35 (3): 456. Aug. 1954.
A female of Nunivak Island herd reached age approaching 23 years.

Cole, James E. (Nat. Park Service, Omaha 3, Nebr.) BUFFALO (BISON BISON) KILLED BY FIRE. Journal of Mammalogy 35 (3): 453-454. Aug. 1954.
There are few historical references to bison being killed by wildfires. This note quotes an old letter that describes an observation made in May 1850 on Oregon Trail between Council Bluffs and Fort Laramie. "There had been a slope of the prairie burned and it had killed hundreds of buffaloes. We saw as many as three hundred lying together with the hair all burned off them while many were roaming around deprived of their eyesight by the fire. Many were shot to put them out of their misery..."

Edwards, R. Y. (B. C. Forest Service, Victoria.) FIRE AND THE DECLINE OF A MOUNTAIN CARIBOU HERD. Journal of Wildlife Management 18 (4): 521-526. Oct. 1954.
Author's summary: "A mountain caribou herd in Wells Grey Park, British Columbia, is one of many in the province that has decreased in size since the turn of the century. Fire appears to be the cause of decline of the Wells Gray herd. Since 1926 about 70 per cent of the forests below 4000 feet have been burned, and caribou, which appear to require mature lowland forests for winter range, are now confined in winter to the unburned forest remnants. The fires were followed by a dramatic change in composition and population density of the

MAMMALS—Hoofed (Except deer)—Continued

mammalian community. The caribou decline was accompanied by declines in a few other species, while the overall effect of fires was to create a mammalian abundance previously unknown. To maintain and eventually to increase this herd, management will include protection of the animals, protection of existing lowland forests from fire, and a long-term endeavour to increase the area of lowland climax or near-climax forests." The author suggests that fire (or intensive logging) may be the cause of caribou declines in many regions.

Fuller, W. A. (Canadian Wild. Service, Fort Smith, N.W.T.) THE FIRST PREMOLAR AND THE CANINE TOOTH IN BISON. Journal of Mammalogy 35 (3): 454-456, illus. Aug. 1954.

First premolar is present in a few specimens. Canines resemble incisors but have different mode of replacement. Nomenclature of molariform teeth is discussed.

Gregg, Frank. (Colo. Game Dept.) RAMS ARE RUGGED. Colorado Conservation 3 (5): 4-8, illus. Sept.-Oct. 1954.

Hunters tell of their experiences in the Colo. 1953 bighorn hunt and the author supplies data on reasons for and results of the hunt. Fifty-eight rams were taken in 14 of the 18 open areas. With one probable exception, all 14 herds suffered from lungworm to some degree. The sex ratio had been about 1 ram per ewe where 1 to 8 would have been better. Ewes had been harassed so much that some were unable to bear young. The harvest of 58 rams did not improve the sex ratio enough, did not relieve concentrations significantly, and did not cause satisfactory dispersion of herds. These aims may be achieved with further hunting and without damage to the population. Another controlled hunt is scheduled for 1954.

Hunter, Gilbert N., and Richard E. Pillmore. (Colo. Game Dept.) HUNTING AS A TECHNIQUE IN STUDYING LUNGWORM INFESTATIONS IN BIGHORN SHEEP. Trans. 19th N. Amer. Wildl. Conf. p. 117-129, map. 1954.

Serious disease losses hit 3 Colo. bighorn herds in 1952-53. This was the third major decline on record. Most likely cause was verminous pneumonia brought on by lungworms. First open season since 1885 was held in 1953. Hunters (169) killed 58 rams. Lung samples were obtained from 14 of 18 open areas and lungworm was found in all but 1 of the 14 areas. Life history and snail hosts of lungworm are discussed. Density of herds is believed to favor lungworm infestations. Hunting is designed to scatter herds (not yet accomplished) and to produce more favorable sex ratio. Arrangements for and results of hunt are described thoroughly.

Jennov, J. G. NOGLE BETRAKTNINGER OVER FORSKELLIGE FORHOLD I NORDØSTGRØNLAND. Naturen no. 14, p. 427-445, illus. 1953. [From Polar Record 7 (48).]

"Number of Musk-ox and reindeer in north-east Greenland; proposals for preservation of Musk-ox and experimental domestication."

Robinson, Cyril S., and Fred P. Cronemiller. (U. S. Forest Service, San Francisco.) NOTES ON THE HABITAT OF THE DESERT BIGHORN IN THE SAN GABRIEL MOUNTAINS OF CALIFORNIA. California Fish and Game 40 (3): 267-271, map. July 1954.

Largely a discussion of food habits, but also has notes on nature of habitat, seasonal movements of herds, water needs, numbers, breeding, and protection. About 220 bighorns occupy the area. They are protected from hunting, have no competition from livestock, and may be increasing. Water seems to be needed daily in summer. Many woody and herbaceous plants are eaten. Rutting begins in late Sept. and most lambs are born in April. Herds have good distribution of age classes. Young animals, lambs, and yearlings predominate.

Rousseau, Jacques. BASIC PRINCIPLES FOR THE PROTECTION OF THE BARREN GROUND CARIBOU AND REINDEER BREEDING IN QUEBEC. Province of Quebec Association for the Protection of Fish and Game, 92nd Annual Report. p. 28-35. 1951. [From Polar Record 7 (48).]

"Recommendations. In English and French."

MAMMALS--HOOFED (Except deer)--Continued

Rousseau, Jacques. LES PROBLÈMES DE CONSERVATION DE L'UNGAVA ET DU LABRADOR. Comptes-rendus de l'Association Canadienne de Conservation, 1952, p. 51-79. [From Polar Record 7 (48).]
"Deals chiefly with problem of conservation of caribou."

Sandoz, Mari. THE BUFFALO HUNTERS. Hastings House, N. Y. 372 p., illus. 1954. $4.50. [From review by B. W. Allred, Soil Conservation 20 (5).]
"...belongs in the reference library of biologists, conservationists and Americana collectors." It is the story of days when the bison were killed off--the story of slaughter, the hunters, the Indians, the settlers, and numerous incidents of brawling and Indian fighting. The book has several pages of bibliography and is recommended by Allred as an interesting historical account.

Smith, Dwight R. THE LIFE HISTORY AND ECOLOGY OF THE BIG HORN SHEEP IN IDAHO. M.S. thesis, University of Idaho. 113 p. 1951.
See WR 73: 45.

Tener, J. S. (Canadian Wildl. Service, Ottawa.) FACTS ABOUT CANADIAN MUSK-OXEN. Trans. 19th N. Amer. Wildl. Conf. p. 504-510. 1954.
A summary of recent findings and current knowledge about the musk-ox. Some of the subjects are: early depletion, present increase and natural redistribution, social behavior, foods, feeding movements, breeding age, rate of reproduction, possible role of light in controlling breeding dates, fighting, age and sex ratios, survival of young, mortality factors. No references are cited, but much of the material has been presented in more detail in another paper by the author which was abstracted at some length in WR 77, p. 33. The present paper, however, gives information for areas other than the Fosheim Peninsula of Ellesmere Island.

MAMMALS--DEER

Basile, Joseph V. AVAILABILITY OF WHITE-TAILED DEER BROWSE WITHIN THE HATTER CREEK ENCLOSURE. M.S. thesis, University of Idaho. 45 p. 1954.

Clover, Melvin R. (Calif. Dept. Game.) A PORTABLE DEER TRAP AND CATCH-NET. California Fish and Game 40 (4): 367-373, illus. Oct. 1954.
Trap has pipe frame and net sides. Can be folded and carried by one man. It is easy to operate and causes minimum of injury to trapped animals. Paper includes list of materials, drawings and photographs, and instructions for construction and operation. Author suggests making trap in various sizes for use with other kinds of animals. A large version worked well on tule elk.

Dasmann, William P., and James A. Blaisdell. (Calif. Dept. Game.) DEER AND FORAGE RELATIONSHIP ON THE LASSEN-WASHOE INTERSTATE WINTER DEER RANGE. California Fish and Game 40 (3): 215-233, map and graphs. July 1954.
Detailed, quantitative report of 4-year study. Authors' conclusions: "The findings...indicate a strong correlation between fawn survival and percentage utilization of bitterbrush leader growth by deer on the Lassen-Washoe winter range. The relationships found here give support to the belief that bitterbrush can serve as an indicator species in management of the deer herd. The studies make it appear that, under the existing demand for bitterbrush by livestock, a moderate decline in fawn survival may be expected where the cropping of bitterbrush leader growth by deer exceeds 25 percent, and a steep decline where it exceeds 34 percent. Were livestock demand changed, this percentage relationship, no doubt, would shift. It would appear, under existing conditions, that deer browsing should not be much above the 25 percent bitterbrush utilization level for good survival of the fawns of the year and good success of fawning during the succeeding season. The generally consistent relationships found in this study indicate that the survey methods used can provide data which are adequate for deer management purposes."

MAMMALS--DEER--Continued

Diem, Kenneth L. (Ariz. Game Comm.) USE OF A DEER CALL AS A MEANS OF LOCATING DEER FAWNS. Journal of Wildlife Management 18 (4): 537-538, illus. Oct. 1954.

Drawings and instructions for use of a call that produces a sound like the bleating of a fawn. The call is used when a doe is seen and behavior of the doe reveals whether or not a fawn is nearby. A dog aided in capture of older fawns for tagging, but how it did so is not stated.

Elder, James B. (Univ. Ariz.) NOTES ON SUMMER WATER CONSUMPTION BY DESERT MULE DEER. Journal of Wildlife Management 18 (4): 540-541. Oct. 1954.

Wild deer in Tucson Mountains, Ariz., drank from artificial containers and volumes could be determined to nearest pint. Amount of water drunk and time spent drinking are tabulated. Bucks averaged 7.3 quarts per day, does 7.0 quarts. This is almost twice as much as indicated by Nichol's experiments with captive deer, and several times as much as reported for captives in Utah by Smith (see WR 77: 36).

Erickson, Arnold B., and Gerald T. Bue. (Minn. Div. Game.) ADDITIONAL MULE DEER RECORDS FOR MINNESOTA. Journal of Mammalogy 35 (3): 457-458. Aug. 1954.

Range is still expanding in Minn.

Graham, Samuel A. (U. Mich.) CHANGES IN NORTHERN MICHIGAN FORESTS FROM BROWSING BY DEER. Trans. 19th N. Amer. Wildl. Conf. p. 526-531. 1954.

Lumbering of hardwoods created conditions favorable for deer. Populations of 25 to 50 or more deer per square mile were found. Studies of exclosures and other plots demonstrated that early forest reproduction was ample, with good variety of tree species. But most of the species were soon browsed out or held to very little growth. The end result will be little except hard maple on heavy soils and balsam fir and certain other conifers on light soils. This will not be disastrous to forestry interests, and at present the situation is not disastrous to deer, for there is still an abundance of food. But the food and shelter of the future is being destroyed over large areas. Unless something is done to change the trend, future herds will be much smaller, and the forest will have little diversification.

Hunt, Robley W., and Lloyd M. Mangus. (US F&WS, Holt, Minn.) DEER MANAGEMENT STUDY: MUD LAKE NATIONAL WILDLIFE REFUGE, HOLT, MINNESOTA. Journal of Wildlife Management 18 (4): 482-495, map. Oct. 1954.

Gives detailed data on population size, quantities and types of browse, utilization of browse, sex and age ratios, average weights of sex and age groups, winter mortality, and travels of marked deer. Management recommendations are made. The herd is not too large, is in good condition, and has low winter losses. Winter range is not overbrowsed. Willow is the principal browse species and is heavily used. It responds excellently to heavy use; in fact it must be kept browsed down or it grows out of reach. Many refuge deer are shot outside the refuge--some of them far outside--and regular hunting on the refuge is not yet necessary. The refuge is a wintering area for deer of adjacent areas, but it is still surprising to find that distances at which tagged deer were recovered off the refuge averaged 22 miles.

Interstate Deer Herd Committee. EIGHTH PROGRESS REPORT ON THE COOPERATIVE STUDY OF THE DEVILS GARDEN INTERSTATE DEER HERD AND ITS RANGE. California Fish and Game 40 (3): 235-266, illus. July 1954.

A long, quantitative paper (33 tables, 5 maps) that contains much information on condition of the herd and its key winter range, and on study methods employed. Readers who are not concerned with this herd may be interested in techniques of study and management that have been decided on, and in data on winterkilled deer. Some subjects discussed are: track and pellet counts; herd composition; sex, age, and stomach contents of winterkilled deer; comparative studies of range condition and forage utilization; range restoration study; livestock competition; deer harvests; and guides to management. The range was still deteriorating, largely because of fires that killed browse and encouraged annual grasses. During 1951-53 the herd was down about to carrying capacity owing to harvests and a winterkill (1951-52) of about 32%. Also, less livestock use of the wintering area was being permitted.

MAMMALS—DEER—Continued

Jones, Gardiner F. (Wash. Game Dept.) THE BLACK TAILED DEER. Washington State, Game Bulletin 6 (4): 4-5, illus. Oct. 1954.
Good summary of findings in Wash. in regard to foods, relative values of certain winter foods, travels of marked deer, and suitable harvests in relation to populations and reproduction. One interesting point is that penned deer nearly starved to death within 3 weeks when fed all the salal, Douglas fir, and hemlock they could eat. These plants are important winter foods simply because of their availability.

McKean, William T. (N. D. Dept. Game.) FALL AND WINTER FOODS OF NORTH DAKOTA DEER. North Dakota Agricultural Experiment Station, Bimonthly Bulletin 17 (1): 25-31. Sept.-Oct. 1954.
Detailed report on stomach contents of 601 whitetails and 60 mule deer. Variations between species and between regions are considered. Browse was most important class of food. Weeds amounted to no more than 8% by volume, which was for whitetails in fall. Representation of crops varied from 1.9% to 25.9%. "Grass ran as high as 13.5 per cent for winter whitetail stomachs due to their feeding from hay stacks. Deer were found dead from malnutrition with their stomachs full of prairie hay." Buckbrush (Symphoricarpos) was by far the most important browse plant. Efforts should be made to protect and increase the acreage of buckbrush; the plant is valuable to grouse and small mammals as well as to deer. Unfortunately, farmers consider it more of a weed than a forage plant.

Ohio. DEER STATUS - OCTOBER - 1954. Ohio Division of Wildlife, Game Survey News 1 (10): 4 p., map and graph. Oct. 27, 1954.
Deer index shows herd to be slightly higher than in year before. Deer are better distributed; they are increasing in many areas, but are being controlled where there are conflicts with human interests. Deer shot in 1953 were in good condition. Including fawns, which comprised about 30% of kill, they averaged over 125 pounds. Only 6% of deer shot were over 4 years old. Pregnant does averaged 1.66 fawns. A map shows relative deer populations of states from Me. to Va., Mo., and Minn.

Pasto, Jerome K., and D. Woods Thomas. (Pa. St. U.) PETE THINKS ABOUT DEER MANAGEMENT. Pennsylvania Game News 25 (10): 12-17, illus. Oct. 1954.
First of 5 articles on deer economics in Pa. This one presents in popular form the basic factors underlying conflicts of interests between hunters and farmers.

Pasto, Jerome K., and D. Woods Thomas. (Pa. St. U.) DEER DAMAGE TO FARM CROPS. Pennsylvania Game News 25 (11): 22-28, illus. Nov. 1954.
Second part of 5. Reports detailed study of deer damage to crops in Potter and Monroe counties in Pa. Both have much farming and many deer. Results are discussed and summarized in 3 tables. About 10% of total crop acreage was injured in Potter Co. and about 8% in Monroe Co. High-value crops were often hardest hit. Hay, oats, buckwheat and corn were most widely damaged. Buckwheat seemed to be the preferred crop food, with corn, snap beans, and oats also well relished. Hay was well down in preference list. Deer reduced crop yields on damaged areas by 38% in Potter Co. and 27% in Monroe Co. Damage decreased rapidly with distance from woods; only 8% of damaged fields were more than 450 feet from deer habitat. Damage occurred in all months but was highest in summer. Some farmers had to adjust their choice of crops and time and location of planting to minimize destruction by deer.

MAMMALS--DEER--Continued

Ward, Larry. (Box 293, Elkins, W. Va.) DEER OR DOGS IN SOUTHERN WEST VIRGINIA? West Virginia Conservation 18 (6): 3-5, illus. Aug. 1954.
Free-running dogs are believed to be the greatest barrier to establishment of good deer herds in southern W. Va. Two areas that had fairly good dog control now have the most flourishing herds of the region. Conclusion: "The best potential deer range in West Virginia today is the extensively-forested areas in the southern counties. A heavy deer stocking program correlated with intensive dog control and the cooperation of the local people can change this potential deer range into a harvestable deer range in a few years."

Webb, Charles Herschel. BIOLOGICAL CHARACTERISTICS OF THE WHITE-TAILED DEER HERD AND AN EVALUATION OF THE RANGE IN THE BLUE RIDGE GAME MANAGEMENT AREA. Master of Forestry thesis, University of Georgia. Georgia Game and Fish Commission. 55 p., illus., mimeo. June 1954. [From Pittman-Robertson Quarterly 14 (4).]

MAMMALS--MARINE

Brown, S. G. (National Inst. Oceanography, England.) DISPERSAL IN BLUE AND FIN WHALES. Cambridge University Press, Discovery Reports 26: 355-384, map and graphs. 1954. 12s. 6d.
Detailed report based on recoveries of marked whales.

Clarke, Robert. OPEN BOAT WHALING IN THE AZORES, THE HISTORY AND PRESENT METHODS OF A RELIC INDUSTRY. Cambridge University Press, Discovery Reports vol. 26. 74 p., 6 plates. 1954. $4.25. [From long review by A. O. Vietor, American Scientist 42 (4).]
Story of an active sperm whale fishery that is still using ancient methods of capture after trying and abandoning bomb guns and other firearms.

Fraser, F. C., and P. E. Purves. HEARING IN CETACEANS. Bulletin of British Museum (Natural History), Zoology 2 (5): 101-114 + 2 plates. Jan. 1954. 4s.
Authors' synopsis. "Essential anatomical features of the region of the ear of cetaceans are described and figured. Earlier hypotheses relating to the mode of hearing in cetaceans are briefly reviewed and criticized. Reasons are given for regarding the method of hearing in cetaceans as being essentially similar to that of terrestrial mammals with certain anatomical modifications required for receiving water-borne vibrations. A simple experiment is described demonstrating the superiority of the walls of the meatus over other parts of the body as a conductor of longitudinal vibrations."

Gunter, Gordon. (Inst. Marine Sci., U. Texas.) MAMMALS OF THE GULF OF MEXICO. In Gulf of Mexico / Its Origin, Waters, and Marine Life. U. S. Fish & Wildlife Service, Fishery Bulletin 89. p. 543-551. 1954.
Recognition characters, occurrence, status, and general information for West Indian seal, manatee, and cetaceans. Considerable amounts of biological data are given for species well known in the Gulf. Records only are given for species poorly known in the area.

Jonsgard, Åge, and Per Øynes. OM BOTTLENOSEN (HYPEROODON ROSTRATUS) OG SPEKKHOGGEREN (ORCINUS ORCA). Fauna no. 1. 18 p., illus. 1952. [From Polar Record 7 (48).]
"Distribution of Bottle-nosed Whale and Killer Whale in Norwegian Sea, 1938-50; biology. English summary, p. 16-17."

Laws, Richard M. THE ELEPHANT SEAL (MIROUNGA LEONINA LINN.). I. GROWTH AND AGE. Falkland Islands Dependencies Survey Scientific Reports (Her Majesty's Stationery Office, London) no. 8. 62 p., illus. 1953. [From Polar Record 7 (48).]
"Biological study in South Georgia and South Orkney Islands, 1948-51."

MAMMALS--MARINE--Continued

Laws, Richard M. THE SEALS OF THE FALKLAND ISLANDS AND DEPENDENCIES. Oryx 2 (2): 87-97, illus. 1953. [From Polar Record 7 (48).]
"Population of various species."

Macdonald, S. D. THE EFFECTS OF A SEAL BITE AT MOULD BAY. Arctic Circular 6 (3): 34-35. 1953. [From Polar Record 7 (48).]
"Detailed medical description of poisoning after a bite on author's wrist by Ringed Seal (Phoca hispida)."

Mansueti, Romeo. (Dept. Research & Ed., Solomons, Md.) "SEA WOLVES" OF THE WEST INDIES. Nature Magazine 47 (9): 471-472, 500, illus. Nov. 1954.
Popular review of history and recent records of the West Indian seal. Once plentiful, this seal has been reduced to the verge of extinction by man. Its preservation will be difficult if not impossible.

McEwen, E. H. (Canadian Wildl. Service, Aklavik, N.W.T.) A SPORADIC OCCURRENCE OF AN ALASKAN FUR SEAL. Journal of Mammalogy 35 (3): 444. Aug. 1954.
One taken far out of normal range, in inland lake in extreme northeastern part of Yukon Territory. Three species of internal parasites are listed.

Sapin-Jaloustre, J. LES PHOQUES DE TERRE ADÉLIE. Mammalia 16 (4): 179-212, illus. 1952. [From Polar Record 7 (48).]
"Biology and habits of Weddell Seal."

Schevill, William E., and Barbara Lawrence. (Woods Hole, Mass.) HIGH-FREQUENCY AUDITORY RESPONSE OF A BOTTLENOSED PORPOISE, TURSIOPS TRUNCATUS (MONTAGU). Jour. Acoustical Soc. Amer. 25 (5): 1016-1017. Sept. 1953. [From Journal of Mammalogy 35 (3).]

Schubert, Kurt. WALBESTAND IM SÜDLICHEN EISMEER. Fischwirtschaft 5 (6): 146-147. 1953. [From Polar Record 7 (48).]
"Methods of estimating antarctic whale stocks."

Wilke, Ford, and Karl W. Kenyon. (US F&WS, Seattle.) MIGRATION AND FOOD OF THE NORTHERN FUR SEAL. Trans. 19th N. Amer. Wildl. Conf. p. 430-439. 1954.
A compact paper that reviews results of numerous recent studies. Among subjects treated are: arrival and departure at breeding grounds, migration off Japan, numbers in Japanese waters, representation of Pribilof herd in Japanese waters, seasonal and geographic representation of sex and age groups, migration off North America, and foods eaten in various parts of range (based on thousands of stomachs). Foods vary from place to place and with availability, but in general fur seals do little damage to economically important fisheries.

Wood, F. G., Jr. UNDERWATER SOUND PRODUCTION AND CONCURRENT BEHAVIOR OF CAPTIVE PORPOISES, TURSIOPS TRUNCATUS AND STENELLA PLAGIODON. Bull. Marine Sci. Gulf & Caribbean 3 (2): 120-133. Sept. 1954. [From Journal of Mammalogy 35 (3).]

MAMMALS--OTHER GROUPS

Talmage, Roy V., and G. Dale Buchanan. (Rice Inst.) THE ARMADILLO (DASYPUS NOVEMCINCTUS) A REVIEW OF ITS NATURAL HISTORY, ECOLOGY, ANATOMY AND REPRODUCTIVE PHYSIOLOGY. Rice Institute Pamphlet 41 (2). Monograph in Biology. viii + 135 p., 1 fig., 1 plate. July 1954. Price not stated.
A paper that should be indispensable to anyone interested in working on or finding information about armadillos. The authors list practically all references on armadillos. They summarize findings on many topics and where this is impracticable, as in anatomy, they provide an annotated guide to the literature. Major sections are: natural history (p. 2-37), parasites (p. 43-60), classification of all armadillos (p. 67-86), anatomy (p. 94-104), physiology and genetics (p. 104-108), reproduction (p. 108-124). The authors' own studies have been

MAMMALS—OTHER GROUPS—Continued

mostly in geographic distribution and reproductive physiology; these topics naturally are covered in greater detail than some other topics. Natural history, however, is critically summarized under several headings, including daily habits, swimming, burrows and nests, trails and signs, food habits, and relationships to climate, soil, water, plant associations and animal associations. The reviewer, who has had some experience with wild armadillos, was pleased to see 2 common misconceptions cleared up: (1) Our armadillo does not roll into a ball and is anatomically unable to do so. (2) Our armadillo is not slow and sluggish—it can outrun a man. We have known an armadillo to outrun a whole gang of healthy young workmen intent on capturing it to eat. The only criticism we are able to make of this paper is the omission of any mention of Neill's 1952 publication (see WR 69: 29).

BIRDS—GENERAL

R. L. M. [R. L. Meredith.] AN AUTOMATIC BOW NET. Falconry News and Notes 1 (2): 19. 1954. [From notice by Frances Hamerstrom, Bird-Banding 25 (3).]
"Description of an ingenious bownet designed for catching hawks. The trap could be adapted for other species."

Murray, J. J. (6 White St., Lexington, Va.) BIOTIC ZONATION IN THE SOUTHERN APPALACHIANS. Raven 25 (7-8): 92-96. July-Aug. 1954.
Thoughtful discussion of life zone and biome relationships to bird distribution, and consideration of some problems in bird distribution.

Rand, Austin L. (Chicago Nat. Hist. Mus.) STRAY FEATHERS FROM A BIRD MAN'S DESK. Doubleday & Co., Garden City, N. Y. 1-224 p., cartoons. 1955. [Dec. 1954.] $3.75.
In the course of world-wide field work and extensive museum studies, Rand accumulated many odd and interesting bits of information about birds and their habits. They are brought together in this popular and unlabored book. Each of the 60 short chapters contains related material on such topics as Birds Using Tools, Maladaptation in Birds, Buried Eggs and Young, Hibernation in Birds, Co-operation by Birds, Poisonous Birds, On Identifying Sea Serpents, Water in the Desert, Bird Graveyards, Can Birds Count, Survival of the Unfit, and Decoration in the Home. Much of the material is unfamiliar, with a believe-it-or-not quality, and almost all of it is entertaining. The book is fine for light but informative reading, is easily read in snatches, and should make a good present for a bird-watching friend who already has his basic references.

Stewart, Paul A. (Ohio St. U.) THE VALUE OF THE CHRISTMAS BIRD COUNTS. Wilson Bulletin 66 (3): 184-195. Sept. 1954.
After much study the author concluded that these counts could be a highly effective means of collecting data on early winter bird populations, but that too many variables now affect the data. He discusses many variables and suggests ways of standardizing counts and analyzing results.

BIRDS—MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Bartholomew, George A., Jr., and William R. Dawson. (U. Calif. at Los Angeles.) TEMPERATURE REGULATION IN YOUNG PELICANS, HERONS, AND GULLS. Ecology 35 (4): 466-472, illus. Oct. 1954.

Benton, Allen H. (N. Y. St. Coll. for Teachers, Albany.) RELATIONSHIPS OF BIRDS TO POWER AND COMMUNICATION LINES. Kingbird 4 (3): 65-66. Oct. 1954.
Coues feared in 1876 that bird populations would be permanently reduced because so many birds were being killed by flying into telegraph lines. Benton believes that birds have learned to avoid this hazard, and that they have benefitted from provision of wires for perching and poles for nesting in or on. Some populations seem to have been favored and some ranges may have been extended by availability of lines of poles and wires.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Paynter, Raymond A., Jr. (MCZ, Harvard U.) INTERRELATIONS BETWEEN CLUTCH-SIZE, BROOD-SIZE, PREFLEDGING SURVIVAL, AND WEIGHT IN KENT ISLAND TREE SWALLOWS. (Part 1.) Bird-Banding 25 (2): 35-58, graph. April 1954. (Part 2.) 25 (3): 102-110, graphs. July 1954. (Part 3.) 25 (4): 136-148. Oct. 1954.
Data are treated statistically and compared with those for other birds. Factors affecting clutch-size are discussed at length.

Ramsay, A. Ogden, and Eckhard H. Hess. (McDonogh School, McDonogh, Md.) A LABORATORY APPROACH TO THE STUDY OF IMPRINTING. Wilson Bulletin 66 (3): 196-206, graphs. Sept. 1954.
Experiments with imprinting mallard ducklings on mechanized mallard decoys.

Wolfson, Albert. (Northwestern U.) SPERM STORAGE AT LOWER-THAN-BODY TEMPERATURE OUTSIDE THE BODY CAVITY IN SOME PASSERINE BIRDS. Science 120 (3106): 68-71, illus. July 9, 1954.
In seminal vesicles, which are in cloacal protuberance.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Bannerman, David Armitage. THE BIRDS OF THE BRITISH ISLES. Oliver & Boyd (Edinburgh and London). Vol. 1: xviii + 356 p. + 41 plates. Vol. 2: viii + 302 + 41 plates. 1953. 45s. net per vol. [From review by Landsborough Thomson, Nature 174 (4425).]
These first 2 volumes of a 6 or 7 volume set cover most of the passerine families. "This is a work on British birds in the grand manner, the like of which one had scarcely expected to see again... The work is sumptuously produced, beautifully illustrated, and written in a leisured style with care and distinction." Paintings for the entire set were made by the late George E. Lodge. The text, based on critical reworking of published and unpublished information, covers such topics as identification, distribution, migration, habits, and breeding. "A special feature is the wealth of information about British migratory species in their other habitats abroad and, where possible, actually on passage..."

Lowery, George H., Jr., and Robert J. Newman. (La. St. U.) THE BIRDS OF THE GULF OF MEXICO. In Gulf of Mexico / Its Origin, Waters, and Marine Life. U. S. Fish & Wildlife Service, Fishery Bulletin 89. p. 519-540. 1954.
Devoted chiefly to distribution and ecological status. Birds are discussed in 3 groups; 1) Offshore birds, 2) Birds of the coast, 3) Land birds over the open gulf. Should be a good source of information on geographic and seasonal occurrence and related topics.

Snyder, L. L. (Roy. Ont. Mus., Toronto.) SUMMER BIRDS OF WESTERN ONTARIO. Transactions of the Royal Canadian Institute 30 (pt. 1): 47-95, map. 1953.
Annotated list of 170 species. Annotations consist chiefly of locality data and discussions of subspecific taxonomy but include seasonal occurrence and breeding data. The region is of special interest as a meeting place of southern and northern, and eastern and western birds. The work is based on studies by numerous individuals over many years.

Stebbins, Cyril A., and Robert C. Stebbins. BIRDS OF YOSEMITE. Yosemite Nature Notes 33 (8, Special Issue): 73-152, illus. Aug. 1954. Price not stated. (Order from Yosemite Nat. Hist. Assn., Box 545, Yosemite Nat'l. Park, Calif.)
A useful guide for layman or amateur. Distinguishing features and habitat of each species are described. Most species are shown in black-and-white drawings. Separate drawings of heads and feet aid in placing birds to group. A simple and apparently practical field key based on coloration and other obvious features facilitates identification of species and groups. The introduction to the pamphlet gives an elementary explanation of life zones of the park and tells how to observe and identify birds. This booklet should be excellent for park visitors who wish to know the birds they see.

BIRDS--CONTROL, MORTALITY

Howell, Joseph C., Amelia R. Laskey, and James T. Tanner. (U. Tenn.) BIRD MORTALITY AT AIRPORT CEILOMETERS. Wilson Bulletin 66 (3): 207-215. Sept. 1954.
Discusses examples of this mortality and considers factors involved. The major paper on the subject to date.

Schorger, A. W. (U. Wis.) A STUDY OF ROAD KILLS. Passenger Pigeon 16 (2): 53-55, graphs. Summer 1954.
Summary of birds found killed on roads between Madison, Wis., and Freeport, Ill., over 18 years. Kill of red-headed woodpecker paralleled decline of species; that of pheasant did not, for road kills were moderate when population was high in 1942, and high when population was low in 1947.

Williston, Hamlin L. DO BIRDS SEE RED? U. S. Forest Service, Southern Forest Experiment Station (New Orleans), Southern Forestry Notes no. 93. p. 2-3. Sept. 1954.
"For the second year in a row, covering seed spots with red-dyed sawdust appears to have inhibited birds from eating loblolly pine seed. In this year's test, scalped spots were sown early in December with 11 lots of loblolly seed. The lots were untreated seed; untreated seed covered with two shades of red sawdust, with blue sawdust, and with yellow sawdust; seed flocked with yellow rayon; seed dyed brilliant bronze, green bronze, and aluminum; and tetramine-treated seed, both uncolored and dyed aluminum. Counts of seedlings and remaining whole seeds were made on April 1. On the spots covered with two shades of red sawdust, 12.9% and 14.4% of the seeds had escaped the birds. Though not enough to insure restocking, this was significantly better than the 2% average of the other nine seedlots." Copied completely.

Wolf, Emil A. (Everglades Exp. Sta., Belle Glade, Fla.) CHAIN-SHOT FIRECRACKER BARRAGE TRIED AS EXPERIMENT DRIVES BLACKBIRDS AWAY, SAVES SPROUTING GLADES CORNFIELDS. Florida Grower and Rancher 62 (8): 13, 28, illus. Aug. 1954.
Large flocks of blackbirds do great damage to sprouting corn and to young ears of sweet corn. Control with guns or planes is ineffective or costly. The best control method now known is one worked out by J. A. Neff and R. T. Mitchell of the Fish & Wildlife Service. It depends on small, powerful firecrackers or aerial bombs. Fuses of these exploders are run through a rope that serves as a slow-burning wick. Spacing along the rope determines timing. In one set-up shown, pairs of small aerial bombs are arranged in a rack which has a hood to protect the rope from rain. This outfit protected an area of 20-30 acres.

BIRDS--PARASITES AND DISEASES

Herman, C. M., W. C. Reeves, H. E. McClure, E. M. French, and W. McD. Hammon. (Patuxent Refuge, Laurel, Md.) STUDIES ON AVIAN MALARIA IN VECTORS AND HOSTS OF ENCEPHALITIS IN KERN COUNTY, CALIFORNIA. I. INFECTIONS IN AVIAN HOSTS. American Journal of Tropical Medicine and Hygiene 3 (4): 676-695. July 1954.
Seven species of Plasmodium were found in 10,459 blood smears from 73 species of birds. Data are also given on duration of infections and on experimental infections. Parts II and III, in same issue, discuss mosquito vectors.

BIRDS--UPLAND GAME--GENERAL

Edminster, Frank C. (U. S. Soil Cons. Service.) AMERICAN GAME BIRDS OF FIELD AND FOREST / THEIR HABITS, ECOLOGY AND MANAGEMENT. Charles Scribner's Sons, N. Y. xx + 490 p., illus. 1954. $12.50.
One of the most important wildlife books of the year and a "must" for every wildlife library. It may be described as a definitive encyclopedia on conservation of our more important upland game birds. The book is far more extensive than the number of pages indicates, for its pages are 8 x 11 inches and bear 2 columns. It contains, in extenso, almost everything known about ecology and management of 13 North American gallinaceous game birds, woodcock, band-tailed

BIRDS--UPLAND GAME--GENERAL--Continued

pigeon, and mourning and white-winged doves. A chapter is devoted to each species or group treated. Material is organized under such headings as origin, range, courtship, fall and winter activities, adaptability, foods, effects of weather, predation, diseases, parasites, relation to man, productivity and populations, and management methods. A selected bibliography is given for each species. Practically all points are discussed simply but at length, making the book suitable for technical reference, teaching, or for reading by management-minded sportsmen. The author's ideas are modern and progressive and his information is drawn from both experience and a broad literature. Numerous authorities assisted with the text. The book has 99 photos of birds and habitats; 30 text figures, including range maps and graphs showing seasonal foods; and 25 tables that treat life equations, habitat types, land-use patterns, food habits, etc. Some readers may feel that the author is a bit too optimistic about the benefits and practicality of habitat improvement. No doubt specialists will find other things to object to in this book, as they do in all books, but 4 wildlife biologists who glanced at the book had only minor criticisms. Very much open to question, however, is the author's use of Pittman-Robertson Quarterly (see his p. xvii) as if it were a regular publication devoted to completed work.

Kinghorn, Glenn, and Robert L. Hoover. (Colo. Game Dept.) BONUS IN BIRDS. Colorado Conservation 3 (6): 12-16, illus. Nov.-Dec. 1954.

A Colo. warden got pheasant eggs from nests disturbed by alfalfa mowing and hatched 232 under bantam hens. Of these, 211 were reared and released into suitable habitat at ages of 9-11 weeks. In the same area, a tract of 85 acres was acquired and intensively developed for bobwhite. Pen-reared quail (bobwhite and scaled) were released there. The scaled quail spread out as much as 25 miles. Quail were also stocked on other areas. Habitat of these areas is being improved with brush shelters and other devices, though not as intensively as on the 85-acre tract. Sportsmen's clubs and business men are coming into the project on a cooperative basis.

Miller, Bill. (N. D. Game Dept.) ARE WE UNDERSHOOTING OUR GAME BIRDS? North Dakota Outdoors 17 (3): 6-7, illus. Sept. 1954.

Most upland game birds in N. D. could hold up perfectly well under heavier hunting. Sharptails are widely scattered and hard to find; few parts of their range are noticeably affected by hunting. Ruffed grouse are local but are hard to find and hard to overshoot. Hungarian partridges are hunted only incidentally, are hard to locate, and have a relatively low kill. Pheasant cocks could and should stand a much heavier kill than they are getting. Pheasant sex ratios for 3 areas, 1949-1954, are tabulated to show that there are several times as many cocks in winter as are necessary. Even after a very poor season--which many hunters thought should have been closed--the percentage of cocks did not drop as far as could have been desired. Where hunting was heaviest, ratio of cocks to hens dropped only to 100:337.

BIRDS--QUAIL

Bookhout, Theodore. SEASONAL AVAILABILITY OF PLANT SEEDS, SOUTHERN ZONE, ILLINOIS. M. S. thesis, Southern Illinois University. 122 p. Aug. 1954.

Deals with seasonal availability in 1951 and 1952 of various plant seeds in 9 land-use divisions. Known food habits of quail in fall of 1951 are correlated with seed availability at that time. Factors affecting availability are emphasized.--W. D. Klimstra.

Campbell, Howard. (N. M. Dept. Game.) USE OF OIL DUST BATHS BY QUAIL. Journal of Wildlife Management 18 (4): 543, illus. Oct. 1954.

Scaled quail, and probably Gambel's also, made heavy use for dusting of spots where oil was spilled on ground. Preference for these spots was obvious. Presumably oil helps control ectoparasites. Officials in N. M. purposely created a number of oily dusting spots near rainwater catchments by pouring a gallon or so of old motor oil on ground.

BIRDS--QUAIL--Continued

Frye, O. E., Jr. (Fla. Game Comm.) STUDIES OF AUTOMATIC QUAIL FEEDERS IN FLORIDA. Trans. 19th N. Amer. Wildl. Conf. p. 298-315. 1954.

Types of feeders, costs of installations, operation of feeders, types and costs of feeds, usage of feeders, interference by other animals, relation to restocking, influence on quail populations as determined by special studies and questionnaires. Three-year averages for study areas indicated that there were twice as many quail on feeder area as on check area. According to questionnaires, average increase in feeder areas after 1 breeding season was 65%, after 2 breeding seasons 180%. Cost per bird of increase probably runs about $1.50 to $2.00. Conclusions: Feeders are a practical tool where food plantings are not feasible, cover is suitable for quail, and food is limiting factor. Probably they are of greatest value in areas of heavy grazing. Costs prohibit widespread use by state game departments, but not by clubs and individuals. Costs compare favorably with those of food planting and other intensive management measures.

Johnson, Bruce C. (Miss. Game Comm.) A LOOK AT A PORTION OF THE 1953-1954 QUAIL HARVEST IN MISSISSIPPI. Mississippi Game and Fish 18 (1): 8-9, illus. Aug. 1954.

Hunting statistics and age ratios. Young of year constituted 80% of bag.

Ohio. OHIO QUAIL POPULATIONS. Ohio Division of Wildlife, Game Survey News 1 (7), 4 p., map and graph. Sept. 1954.

Although not legal game in Ohio, quail have been studied for several years. They occur in all counties but are commonest in southern Ohio. Map shows relative densities. Absolute densities of 17 to 192 quail per square mile were found in 5 study areas. Populations are as high as in many states where quail hunting is traditional. Populations have been high and stable for last 4 years. Winter losses (graph) are heavy, about 60-70% in 1953-54, but are compensated by reproduction. Young of 1953 made up over 80% of winter population. Considering Indiana data, it seems that Ohio could harvest about 700,000 quail a year. This would nearly equal the pheasant kill.

Pierce, Robert. (Ken. Dept. Wildl. Resources.) THE WHERE, WHEN, AND HOW ON RELEASING PEN-RAISED BOBWHITE QUAIL. Kentucky Happy Hunting Ground 10 (5): 32-33, illus. Sept. 1954.

Includes many practical suggestions.

Swank, Wendell G., and Steve Gallizioli. (Ariz. Game Comm., Phoenix.) THE INFLUENCE OF HUNTING AND OF RAINFALL UPON GAMBEL'S QUAIL POPULATIONS. Trans. 19th N. Amer. Wildl. Conf. p. 283-295, graphs. 1954.

Winter rainfall is the factor limiting abundance. Hunting did not cause the crash of 1942-43. Closed seasons, 1946-48, did not result in noticeable increase. Hunting that took 18% to 31% of a study area population for 3 years did not permanently depress quail numbers. An unhunted area that had somewhat lower population because of less ground vegetation had about the same post-hunt population as the hunted area. Population trend was upward in region during study. It is concluded that heavy hunting is in order in years of high populations. Not yet determined for Gambel's quail is whether or not it is wise to hunt during lows.

BIRDS--PHEASANTS

Dale, Fred H. (Patuxent Refuge, Laurel, Md.) INFLUENCE OF CALCIUM ON THE DISTRIBUTION OF THE PHEASANT IN NORTH AMERICA. Trans. 19th N. Amer. Wildl. Conf. p. 316-322. 1954.

Research on calcium requirements of ringnecks indicated that birds on what was roughly equivalent to a natural diet but with granitic grit produced few eggs; those on the same basic diet but with limestone grit reproduced normally. Inability of the pheasant to balance its calcium requirements apparently results from its high dependence on corn and other grains low in this element. Rough estimates indicate that the pheasant can obtain approximately half the required

BIRDS--PHEASANTS--Continued

amount of calcium from its normal diet. The remaining need must be met from calcareous grit or calcium-rich soils. Soils in the arid western half of the U. S. may be sufficiently rich in calcium for this purpose, but soils east of the Dakotas differ widely in calcium levels. Distribution of pheasants in the eastern half of the U. S. roughly parallels the abundance of calcium in surface soils. This research does much to explain distribution of the pheasant in North America; it also suggests lines of further research to investigate the possibility of supplying limestone, as a management measure, in areas deficient in calcium.--Fred H. Dale.

Hanlon, Robert W. (Mankato, Minn., High School.) SAVE THAT HEN PHEASANT. Minnesota Naturalist 5 (1): 19-20. Sept. 1954.

Pheasant hunting statistics for the Mankato area are presented for the 3 years 1951-53. Percentage of hens (not legal game) averaged 10.64. Tabulated data suggest that "when pheasants are abundant, the hunter shows a respect for hen protective laws, but when birds are hard to find there seems to be a strong temptation to take a hen rather than to go home empty handed." Such data ordinarily would be impossible to get; the author got it through the cooperation of numerous high school students in his classes. Students were well trained for the study and the data are believed to be reliable.

Klimstra, W. D., and Donald Hankla. (So. Ill. U.) PRELIMINARY REPORT ON PHEASANT STOCKING IN SOUTHERN ILLINOIS. Illinois Academy of Science Transactions 46: 235-239. 1953.

In 1950, 300 game-farm pheasants (5 hens per cock) were released on Crab Orchard Refuge. They dispersed widely but many were found dead near release site. Of 18 nests found, only 1 was successful; the rest suffered desertion or predation. In April 1951, 22 game-farm birds (5:1 sex ratio) were pinioned and released on a 7-acre island covered with grass, brush, and trees. Shelled corn was scattered about to provide constant food supply. Three males established territories. Many of the eggs laid were fertile but 87.5% of nests failed, largely because of egg predation by crows and turtles. Two successful nests yielded 9 young from 17 eggs. The whole colony disappeared by fall without any apparent predation on adults. In Feb. 1952 a similar planting was made with 27 birds. Many of the adults were killed by marsh hawks and all were gone by June 10. One clutch of 6 eggs was found but later perished, probably because of death of female. Results of the island experiments are attributed in part to pinioning, lack of wildness in stock, and crowding. High temperatures may have contributed to poor hatching.

Klonglan, Eugene D. (Iowa St. Coll.) PHEASANT PRODUCTION IN WINNEBAGO RESEARCH AREA--1954. Iowa Conservationist 13 (9): 69, illus. Sept. 1954.

Spring breeding population was best since early forties--about 55 hens and 20 males per square mile. But of 161 nests, only about 17% were successful. Late frosts caused late nesting cover and late nesting. Mowing was done at usual dates and most nests were destroyed, including practically all those in hayfields. Success in oat fields was approximately 19% as compared with 60% in most years. Success was higher than usual in ditches and fencerows and about the same as usual in sloughs, pastures, and groves. Unlike most years, there was no peak hatching time; hatching was scattered through June and early July. Heavy rains in June had little adverse effect, for most clutches had not yet hatched. There will be no bumper crop of pheasants on the area in 1954, and the frosts of early May can be blamed.

BIRDS--PHEASANTS--Continued

Spiegel, Leonard E., and Richard E. Reynolds. (Wildl. Div., Delaware, Ohio.) RESPONSES IN WEIGHT AND REPRODUCTION OF RING-NECKED PHEASANTS FED FRUITS OF GRAY DOGWOOD AND MULTIFLORA ROSE. Trans. 19th N. Amer. Wildl. Conf. p. 153-155. 1954.

Gray dogwood, Cornus racemosa, fruits appeared in 85% of a sample of 46 pheasant crops, gizzards, or droppings. The plant fruits heavily, has persistent fruits, and is common in abandoned fields and hedgerows in N. Y. Fruits of Rosa multiflora appeared in 10% of a sample of 41. Fruits of both species were analyzed chemically (results tabulated) and fed to experimental pheasants in pens. Birds on game-farm rations maintained weight at a higher level, but there were no drastic changes in any pens. The experimental diets seemed to produce no detrimental effects, and it is concluded that fruits of gray dogwood and multiflora rose are nutritious pheasant foods. "Grossly estimated, one pound of gray dogwood fruit is the dietary equivalent of about two pounds of rose hips or about one pound of a mixed-grain diet."

Weston, Henry G., Jr. (Grinnell Coll.) THE WINTER-SPRING MOVEMENTS OF THE RING-NECKED PHEASANT IN NORTHERN IOWA. Iowa State College Journal of Science 29 (1): 39-60, maps and graphs. Aug. 1954.

The major report of a doctoral study made to determine value of state-owned marshes in maintaining winter concentrations of pheasants. Work centered around Birge and Grass Lake Game areas. Birds were trapped and marked with leg bands and by painting tail feathers. Data are given on winter weights, populations, and sex ratios. Numbers and activities of birds present are correlated with winter weather. Winter use of cover types is discussed. Nesting populations on and around study areas are described. Turnover rate between winters was 91-92%. Survival through 3 winters was represented by the series 100 - 7.4 - 0.7. Nesting populations were about the same each year despite marked increases in maximum winter populations. In winter, few birds moved more than ½ mile from study areas. In spring, 70-83% of birds that had wintered on study areas dispersed onto surrounding farm land. By end of May they had dispersed an average distance of 1.4 miles; a few went more than 5 miles. Data are also given on dispersal distances for March and April, and on band returns. [For other papers on this study see WR 68: 31 and WR 74: 33.]

BIRDS--GROUSE, PARTRIDGE, ETC.

Brown, Charles P. (N. Y. Cons. Dept.) DISTRIBUTION OF THE HUNGARIAN PARTRIDGE IN NEW YORK. New York Fish and Game Journal 1 (2): 119-129, maps. July 1954.

Author's abstract: "Some 27,750 Hungarian partridges were stocked in New York State during the period from 1927 to 1932. The birds disappeared in most localities soon after release, although colonies persisted in a few places. Along the St. Lawrence River in northern New York the birds gradually increased until, in 1952, it was possible to declare an open season. In order to obtain information concerning the present-day distribution and abundance of these birds questionnaires were mailed to game protectors, and additional data were obtained from district game managers. As a result, it is known that the species occurs in eight counties but is present in appreciable numbers only in Jefferson, St. Lawrence, and Franklin Counties. Soil types, land use, climatic conditions, and the status of other game species are discussed in relation to the Hungarian partridge population. Primary reasons for success of the birds in the St. Lawrence valley are considered to be the dry weather in late spring and summer, the large proportion of cropland in grain, the presence of suitable cover, light hunting pressure, and lack of competition from pheasants."

Caswell, Edwin B. A PRELIMINARY STUDY ON THE LIFE HISTORY AND ECOLOGY OF THE BLUE GROUSE IN WEST CENTRAL IDAHO. M. S. thesis, University of Idaho. 105 p. 1954.

BIRDS—GROUSE, PARTRIDGE, ETC.--Continued

Christensen, Glen C. (Nev. Game Comm.) CLOSED SEASON ON CHUKAR PARTRIDGE--TOO FEW BIRDS. Nevada Fish and Game 1 (6): 15-16. Aug.-Sept. 1954.
See also p. 5-6 of journal cited. Chukars were booming and dominating the upland game bird picture in Nev. 3 years ago, but now they have declined so badly that the season is being closed. Populations and broods of 1954 are even smaller than those of 1953. Drought is blamed.

Dalke, Paul D. (U. Idaho.) BLUE GROUSE HUNTING IN IDAHO. Idaho Wildlife Review 7 (1): 10-11, illus. July-Aug. 1954.
Text and photos demonstrate sex and age characteristics. Text discusses age ratios and hunting success in various areas, 1952 and 1953; gives table of weights by sex and age classes; and tells in a general way of seasonal food habits.

Devitt, O. E., and D. S. Miller. (Ont. Dept. Lands & Forests, Toronto.) THE PRAIRIE CHICKEN NESTING AT GORE BAY, MANITOULIN ISLAND [Ontario]. Canadian Field-Naturalist 68 (2): 93. April-June 1954.

Dorney, Robert S. (Wis. Cons. Dept.) RUFFED GROUSE BONUS. Wisconsin Conservation Bulletin 19 (8): 11. Aug. 1954.
In 1953 ruffed grouse were legal game for 9 weeks in 7 counties of sw. Wis. Over 30,000 grouse were shot in these counties. In 1952, with a 3-week season, only 11,000 were shot. Thus, with 6 extra weeks, about 19,000 more grouse were bagged. "Were the birds overshot? Spring surveys in 1954 gave us a clear answer. Instead of a reduction, the population showed a healthy increase. Southern [Wis.] hunters can have their cake and eat it too!"

Farmes, Robert E. (Thief River Falls, Minn.) SUGGESTIONS FOR SAVING THE PRAIRIE CHICKEN IN MINNESOTA. Minnesota Naturalist 4 (3): 44-45, illus. March 1954.
Two moist, grassy tracts (Wertler Swamp in Norman Co. and Goose Lake in Pennington Co.) should be purchased by state and managed for prairie chickens and waterfowl. Several other types of game would also benefit. The tracts still have prairie chicken populations, although most of the chickens are known to leave Goose Lake in the winter, perhaps for grain. Booming ground areas of 40-80 acres should be bought or leased. Hay could be harvested from them after nesting season.

Hogue, Jack. (Colo. Game Dept.) THE GROUSE AND THE EAGLE. Colorado Conservation 3 (6): 8-11, illus. Nov.-Dec. 1954.
Suspecting that golden eagles killed many sage grouse, the author selected a study area that had many grouse and an eagle nest. He counted the animals killed during a nesting season. "The total numbers of birds and animals found killed by the eagles were as follows: 23 cottontail rabbits, 29 jackrabbits, and the alarming number of 131 sage grouse." Also, "I found that during an average winter, an eagle will kill a grouse almost every day for a period of about five months." The author recommends reducing eagle populations by hunting adults and by destroying nests. He does, however, credit eagles with breaking up grouse concentrations and thereby greatly reducing incidence of 2 diseases.

Leach, Howard R., and Arthur L. Hensley. (Calif. Dept. Game.) THE SAGE GROUSE IN CALIFORNIA, WITH SPECIAL REFERENCE TO FOOD HABITS. California Fish and Game 40 (4): 385-394, illus. Oct. 1954.
History and range in state (map), hunting statistics for 1950-52, recognition characters of juveniles, age ratios, weights, hunting-season food habits of 175 birds. During the 3 years, hunting pressure rose and hunting success fell. Number of young per 100 adults was 284 in 1950, 131 in 1951, and 304 in 1952. Brood counts made in summer of 1952 gave ratio of 1 hen to 4.4 young. Food habits are reported in tables and discussion. As usual, sage led the list, followed by a few other plants in significant amounts and many in trace amounts. Grasshoppers were important (32.5% by volume, 97.5% by occurrence) in one set of stomachs. One grouse from a waterfowl management area had nothing but wheat grains in stomach.

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Ohio. GROUSE HUNTING PROSPECTS FOR 1954. Ohio Division of Wildlife, Game Survey News 1 (11). 4 p., map. Nov. 3, 1954.
Distribution and areas of abundance of ruffed grouse in Ohio. Grouse are not considered cyclic in Ohio. Hunting season is 60 days with bag limit of 3 and possession limit of 6. Hunting has not hurt populations. The chief depressing factor is bad weather during nesting.

Palmer, Walter L. (Mich. Dept. Cons.) DEER AND GROUSE. Michigan Conservation 23 (5): 29-30, illus. Sept.-Oct. 1954.
Evidence suggests that somewhat higher numbers of grouse are produced in range that is not overbrowsed by deer. It is possible, however, that overbrowsing is sometimes beneficial to grouse, especially sharptails, because it maintains forest openings. "From what we know now, we can conclude that a reasonably large deer herd probably encourages grouse by preserving openings and thinning timber; but an excessively large herd makes the woods too park-like and discourages grouse. Here we have another of Nature's balances." For technical report see WR 76: 67.

Palmer, Walter L. (Mich. Dept. Cons.) UNUSUAL RUFFED GROUSE DENSITY IN BENZIE COUNTY, MICHIGAN. Journal of Wildlife Management 18 (4): 542-543. Oct. 1954.
Fifteen grouse nests were found on 105 acres in Benzie Co., Mich., from May 19 to June 26, 1953. This presumably represented a spring population of at least 29 grouse per 100 acres. A ten-man drive made in the fall over 300 acres (including the 105 acres) turned up 111 grouse. The area is described. It appears rather open for ruffed grouse habitat. "...the spring census of 15 nests on 105 acres is extremely reliable, and represents the highest density of ruffed grouse nests reported in the literature."

Peterle, Tony John. (Mich. Dept. Cons.) THE SHARP-TAILED GROUSE IN THE UPPER PENINSULA OF MICHIGAN. Ph.D. thesis, University of Michigan. 275 p. 1954. [From long abstract in Dissertation Abstracts 14 (8).]
Topics treated include: review of literature on species, history in Mich., inventory techniques, productivity of habitats, effects of burning and herbiciding, effects of coniferous plantings, behavior on breeding grounds, nesting, hatching, predation, brood behavior, sex and age ratios, movements, flocking habits, diseases, trapping, food habits, land-use economics. Dancing ground count is considered most practical method for determining population trends. Density of woody vegetation was most important factor limiting populations. Control of this vegetation by burning revealed need of more practical information. Burning probably will not yield desirable results on peat and muck soils. Trials demonstrated that use of herbicides was not economically feasible. Most important factor controlling display behavior seems to be light intensity. Territoriality was evident on dancing grounds. Trapping was best done with cannon net. Length of caeca and small intestines appeared to be correlated with nutritiousness of available foods. Management of land for sharptails in Mich. is not compatible with use of the land for high financial returns. In other words, the bird has no future in Mich. if purely economic considerations are determinant.

Pyrah, Duane B. A PRELIMINARY STUDY TOWARD SAGE GROUSE MANAGEMENT IN CLARK AND FREMONT COUNTIES BASED ON SEASONAL MOVEMENTS. M.S. thesis, University of Idaho. 90 p. 1954.

BIRDS--GROUSE, PARTRIDGE, ETC.--Continued

Vogelsang, Jerry. (3218 W. Highland Blvd., Milwaukee, Wis.) SAVE THE PRAIRIE CHICKEN! Passenger Pigeon 16 (2): 62-63. Summer 1954.
Extensive grazing and ploughing and some brush invasion are eating into the 38,000 acres of prairie chicken range in the Plainfield area of Wis. The area now has what is perhaps the highest density of prairie chickens in the world. Approximately 13% of the range was lost in the 2 years 1951-53. "At this rate, the chickens of Wisconsin have about fifteen years to go. What can be done?" The Hamerstroms have suggested buying up scattered tracts of 40 and 80 acres as nesting habitat. With this "checkerboard plan" a breeding nucleus can be kept to repopulate adjacent areas as they become available. The state is much interested "but will take no action to purchase prairie chicken lands unless sufficient public interest is shown." The Wis. Cons. League has already bought one 40-acre parcel. The Wis. Soc. for Ornith. has decided to raise funds for another parcel. "Nature lovers have been justifiably criticized by sportsmen for saying too much and doing too little. However, this is our opportunity for concrete action."

BIRDS--TURKEY

Burget, Martin L. (Colo. Game Dept.) TURKEY COMEBACK. Colorado Conservation 3 (5): 25-30, illus. Sept.-Oct. 1954.
Story of turkey restoration in Colo. and difficulties involved. Map shows present and potential range and range at time of low in 1925. Colo. has "plenty of turkeys," and has had open seasons for last 5 years. Last year hunter success was over 50%, while national average is only 13%.

Holbrook, Herman. (S. C. Wildl. Resources Dept.) PREDATION NOT SERIOUS PROBLEM ON REFUGE. South Carolina Wildlife 1 (3): 2, 21, illus. Summer 1954.
Turkey management is the prime aim on the 60,000-acre Francis Marion Wildlife Preserve. Many kinds of predators live on the preserve, yet the only ones controlled are hogs and raccoons. Both raccoons and hogs compete with turkeys for native and cultivated foods, and both are nest predators. Raccoons are live-trapped and released up-state. Control of other animals would be uneconomical and apparently is not necessary. "Based strictly on our personal observations, the bald eagle is the leading predator of adult wild turkeys, since we know of three definite kills and have observed numerous attempts in which the turkey escaped. We have no record of turkey kills by wildcats, although four kills of deer have been located."

Wagner, Fred H. (Wis. Cons. Dept.) WILD TURKEYS IN WISCONSIN. Wisconsin Conservation Bulletin 19 (11): 11-14, illus. Nov. 1954.
Turkeys used to live in southern Wis. but were exterminated by 1881. Map shows old records compiled by A. W. Schorger. Now 69 adult turkeys of relatively wild stock have been released on conservation areas in central Wis. The birds have scattered fairly well and have become wilder. Progress of the colonies is being watched.

Walker, Eugene A. (Texas Game Comm.) DISTRIBUTION AND MANAGEMENT OF THE WILD TURKEY IN TEXAS. Texas Game and Fish 12 (8): 12-14, 22, 26, illus. July 1954.
Each natural region of state is described and the turkey population of each is discussed briefly. Management is then taken up. Supplemental feeding is considered good in emergencies and in helping released birds, but too often it is used to concentrate birds for hunters. Concentrations at feeding sites may aid spread of disease. Feeding may also have dangerous effects on a population when suddenly stopped. Overgrazing is hard on turkey range, especially during drought. More flexible laws are needed to protect brood stock during times of drought and other unfavorable conditions. Predation remains a scape-goat for many persons but is important only when reproduction is low or nil, as during drought. Removal of trees and brush to improve grazing lands has had serious effects on turkey foods, cover, and roosting sites.

BIRDS—DOVES AND PIGEONS

[Allison, Donald G.,and Thomas L. Quay.] SUPPLEMENT TO MOURNING DOVE POPULATIONS IN NORTH CAROLINA. (A COMPILATION OF ORIGINAL DATA IN THE FORM OF TABLES, GRAPHS AND FIGURES ON WHICH CONCLUSIONS EXPRESSED IN THE ABOVE BULLETIN WERE BASED.) North Carolina Wildlife Resources Commission. 55 unnumbered p., including maps and graphs. June 1954.

"The tables, graphs and figures in this supplement to the publication, Mourning Dove Populations in North Carolina, are a compilation of the original data... Most of the following material has been considered and discussed in the published bulletin, however, some was intentionally omitted from the publication as it was of a general nature or it was felt that it was not conclusive enough for final analysis. As a matter of record and for the consideration and use of technicians engaged in mourning dove research, this supplement has been prepared for limited distribution." For notice of publication mentioned, see WR 77: 51.

Anonymous. WHY CLOSE THE WHITEWING SEASON? Texas Game and Fish 12 (10): 15. Sept. 1954.

No hunting of whitewing doves is to be permitted in Texas in 1954. Hurricane, disease, loss of nesting cover and other factors have hit the bird so hard that it has declined 87% in 5 years. Unfavorable nesting conditions have extended well into Mexico. It is feared that if hunting were allowed this year, and the remaining birds happened to be concentrated, the population might be unable to recover. The situation is expected to improve as citrus trees that were planted after the 1951 freeze begin to provide good nesting sites.

Hanson, H. C. (Ill. Nat. Hist. Survey.) MORE MOURNING DOVES FOR FIFTY-FOUR. Illinois Wildlife 9 (4): 2. Sept. 1954.

Dove populations in Ill. have fluctuated widely in the last 5 years. Bird lovers have demanded closed seasons. Nesting studies demonstrated that in 1952 the population was at one of its lowest points in recent decades. But in 1953 and 1954 the increase was 95% and 63% over the nesting populations of the preceding years. In consequence, 5 more hunting days were allowed in 1954. Dove populations have fluctuated before, and hunters need not be blamed for the recent decline. Present and future peaks are likely to be lower than before owing to removal of osage hedges from large areas. Planting of spruce and pine are best remedy for this lack.

Levine, Norman D. (U. Ill.) LEUCOCYTOZOON IN THE AVIAN ORDER COLUMBIFORMES, WITH A DESCRIPTION OF L. MARCHOUXI MATHIS AND LEGER 1910 FROM THE MOURNING DOVE. Journal of Protozoology 1 (2): 140-143, illus. May 1954.

Thompson, St. Clair, Jr. (Miss. Game Comm.) WE COULD SHOOT MORE DOVES. Mississippi Game and Fish 18 (2): 6-7, illus. Sept. 1954.

Inspection of bagged doves "since 1948 has shown that the young-of-the-year outnumber the adults each fall by a ratio of about three to one. This fall ratio...proves that the average life of a mourning dove in the wild is something less than two years. The ratio also shows that over half of the total dove population is lost from one year to the next." Banding indicates that hunter kill is of little importance as compared to total mortality. Weather, disease, and enemies kill far more doves than hunters. The writer believes that longer seasons and larger bag limits are in order.

BIRDS--WATERFOWL

Anonymous. IS THE "SAWBILL" A VILLAIN? Washington State, Game Bulletin 6 (3): 3-4, 11, illus. July 1954.

Economics and food habits of mergansers in Wash. This article is based largely on a report by Fish Biologist Harry Senn. Original information on foods and populations are used to estimate quantities of fish eaten by mergansers on specific waters. It is concluded that mergansers are a very expensive nuisance on rehabilitated lakes where there are only game fish. Recommended is a long open season during which mergansers could be shot and driven from prime fishing waters.

BIRDS--WATERFOWL--Continued

Baker, John H. (Nat. Audubon Soc.) [CRITICISM OF 1954-55 WATERFOWL REGULATIONS.] Audubon Magazine 56 (5): 218-220. Sept.-Oct. 1954.
Many sportsmen and game officials criticise waterfowl regulations as too restrictive of hunters and too protective of birds. Here is a sample of pressure from the opposite direction. The President of the National Audubon Society attacks the regulations for failure to give proper protection to the resource, for permitting hunting too late in the season and too late in the day, for being based on data in which a 20% change is not regarded as significant, for being liberalized on the "excuse" of depredation control, for allowing dangerous baiting practices, and for other reasons. The Canadian system of handling depredation is considered sound, and the Canadian scheme of depredation insurance is praised.

Ballou, Robert M., and George F. Wrakestraw. (Wyo. Game Comm.) MORE GEESE FOR WYOMING. Wyoming Wild Life 18 (10): 4-7, 35, illus. Oct. 1954.
Describes results of numerous transplants made to establish new flocks. One of the chief conclusions is that goslings are best to use in stocking. When they are released on large bodies of water with abundant food and protection from hunting, successful establishment is likely. Yearlings tend to disperse from release site and to have high hunting mortality.

Barrington, Gordon. (US F&WS.) WATERFOWL SLUM CLEARANCE. Kentucky Happy Hunting Ground 10 (5): 14-15. Sept. 1954.
Résumé of results of waterfowl habitat management experiments at Patuxent Research Refuge, U. S. Fish & Wildlife Service, Laurel, Md.

Bennett, Esther. NESTING BIRDS OF THE SHORELINE AND ISLANDS OF CRAB ORCHARD LAKE WITH PARTICULAR REFERENCE TO THE CANADA GOOSE, BRANTA CANADENSIS (LINNAEUS), AND THE EASTERN RED-WING, AGELAIUS PHOENICEUS (LINNAEUS). M.S. thesis, Southern Illinois University. 42 p. June 1953.--W. D. Klimstra.

Beshears, W. Walter, Jr. (Ala. Dept. Cons.) THE WATERFOWL KILL IN ALABAMA. Alabama Conservation 26 (2): 10-12, illus. Sept.-Oct. 1954.
Discussion of waterfowl hunting statistics for 1952-53 and 1953-54.

Bossenmaier, Eugene F., Theodore A. Olson, Myrtle E. Rueger, and William H. Marshall. (Delta Waterfowl Res. Sta., Manitoba.) SOME FIELD AND LABORATORY ASPECTS OF DUCK SICKNESS AT WHITEWATER LAKE, MANITOBA. Trans. 19th N. Amer. Wildl. Conf. p. 163-175. 1954.
Duck die-offs at Whitewater Lake occurred every year since 1944 and certainly occurred earlier. Deaths often ran into many thousands per year. The present paper describes area and discusses die-offs, possible mortality factors, and results of laboratory studies. It is concluded that cause of these die-offs is not yet known, but that botulism and/or blue-green algae poisoning probably were responsible.

Cooch, Graham. (Canadian Wildl. Service, Ottawa.) ROSS GOOSE IN THE EASTERN ARCTIC. Condor 56 (5): 307. Sept.-Oct. 1954.

Dresser, Cleveland van. WHAT'S HAPPENING TO OUR DUCKS? PART 9. THE PACIFIC FLYWAY--FLIGHT TO OBLIVION? Sports Afield 132 (2): 85-89, illus. Aug. 1954.
Millions of ducks funnel into Calif. There most waterfowl habitat has been converted to agricultural use, waterfowl management areas are too few to handle the flocks, and there is opposition to creation of more management areas. Heavy crop damage and hatred of waterfowl ensue despite herding, frightening, and feeding on refuges. The Tule Lake-Lower Klamath Refuge, a key element in the management system, is threatened with homesteading. State and federal refuges around Salton Sea have had much of their acreage ruined by strongly saline water of the rising Salton Sea. More good land is prohibitively costly, and there is no legal provision for use of irrigation water for waterfowl. Consequently, crop damages in the Salton Sea area are severe. The situation in Calif. is so bad that the state Department of Fish and Game has gone on record as favoring a policy of "reducing the existing numbers of waterfowl to fit the present habitat." Alternative solutions are blocked by cost factors as well as strenuous opposition from agricultural interests.

BIRDS—WATERFOWL—Continued

Dresser, Cleveland van. WHAT IS HAPPENING TO OUR DUCKS? CONCLUSION. Sports Afield 132 (3): 38-40, 43, 46, illus. Sept. 1954.

Summarizes main points of previous installments and makes several recommendations. Hunters should keep track of conservation problems and make their wishes known where it will count. A sensible balance must be struck between agricultural and wildlife interests. Now waterfowl almost always get the short end of the deal; their huge cash value is often ignored. The Fish & Wildlife Service should acquire more management areas and open parts of them to hunters. State game commissions should be taken out of politics. We need cooperation of industry as well as that of state and federal agencies; we must realize that the day of multiple use is here.

Dresser, Cleveland van. WHAT'S HAPPENED TO THE DUCK STAMP MONEY? Sports Afield 132 (5): 84-86. Nov. 1954.

Many people expected the bulk of the duck stamp money to be spent for purchase of waterfowl areas. This was impossible under financial and other restrictions imposed by Congress, Bureau of Budget, and Dept. of Interior. From 1935 through 1954 the total of $34.6 million was spent as follows: development and maintenance of waterfowl refuges, $21.7 million; land acquisition, $5.9 million; enforcement and surveys, $3.5 million; waterfowl research, $2.8 million; to Post Office for printing and handling duck stamps, $578,515. Development and maintenance was so large an item because of shortage of other funds for the work, and because large areas that required work were being acquired in other ways. "In short, through the land transfers [from other agencies] and purchases already outlined, the Fish and Wildlife Service has obtained a total of 2,167,926 acres of land suitable for waterfowl management without spending a single cent of Duck Stamp money. All this acreage has been acquired since the Duck Stamp Act was passed in 1934."

Elder, William H., and Milton W. Weller. (U. Mo.) DURATION OF FERTILITY IN THE DOMESTIC MALLARD HEN AFTER ISOLATION FROM THE DRAKE. Journal of Wildlife Management 18 (4): 495-502. Oct. 1954.

Report of experiments made over 3 laying seasons with a total of 107 domestic hen mallards. After separation from males, fertility of eggs laid during first week was 64%, second week 37%, third week 3%. There was considerable variation between hens; this may have depended in part on recency of mating before separation. Hatchability of fertile eggs laid after separation was 73% for first week, 64% for second, 0% for third. If same situation prevails with wild ducks, an abandoned female could not renest and lay fertile eggs without remating. It is assumed that most drakes that leave their hens enter eclipse plumage and are sexually inactive. New males in breeding condition are therefore needed, and herein may lie the explanation for the excess of males so often reported for ducks.

Evans, Thomas R. (195 S. Cleveland Ave., St. Paul 5, Minn.) LIVING QUARTERS FOR WATERFOWL. Conservation Volunteer 17 (100): 2-6, illus. July-Aug. 1954.

Drainage in U. S. increased to 103 million acres in 1950. In some areas ¼ to ½ of the drainage affects waterfowl. Iowa has lost its waterfowl breeding areas almost completely. In prairie pothole region at least ¼ of the drainage hits waters important to ducks. Two to three percent of all potholes in Dakotas and Minn. are drained each year. All of 36 marshes being studied in a Minn. county were drained in 2 years. One project will drain 299 of the best duck marshes in Minn. One project on Gulf Coast will destroy wintering grounds of some 100,000 ducks. What can be done? Public aid should be refused landowners for destruction of aquatic areas of high public value. State and federal wildlife conservationists should work closely with landowners and soil conservation districts. Encouragement of grassland rather than grain farming would help farmers and soil and would alleviate demands for drainage. Public purchase of best wetlands is important though costly. Minn. has program for such purchases. Old and new wetlands can be managed for better production. Development and management of wetlands by private enterprise for income and wildlife

BIRDS—WATERFOWL—Continued

has real possibilities, as Wis. has shown. Revision of state drainage laws may help. Too little is being done in most of these fields and drainage is pitifully far ahead of restoration. "Modified farming practices and paying farmers to leave land idle have not been tried. They could have a far greater effect on wildlife interests than any of the other approaches. They will be slow in coming at best and may be much too late."

Farley, John L. (US F&WS.) WATERFOWL POTENTIALS. Trans. 19th N. Amer. Wildl. Conf. p. 94-101. 1954.

Hunting pressure is growing while waterfowl habitat is dwindling. No less than 12 million acres of intensively managed habitat are needed to keep waterfowl near their present level. Much of the necessary work will have to be done by states through PR funds; Fish & Wildlife Service funds are much smaller. Although we are losing more habitat than we are gaining, there are some reasons for optimism. Flyway Councils and state programs are becoming more effective. It has just been demonstrated that a huge area along the McKenzie River, N.W.T., has production potentials equal to those of southern Saskatchewan. The author also discusses the reasons why some previously inviolate refuges were opened to hunting, and replies to criticisms of this action. An interesting discussion that follows the paper goes into the urgent need for more refuge and management areas and explains why more Duck Stamp money is not being used for their acquisition.

Foley, Donald. (N. Y. Cons. Dept.) SURVIVAL AND ESTABLISHMENT OF WATERFOWL RELEASED AS DUCKLINGS. New York Fish and Game Journal 1 (2): 206-213. July 1954.

Author's abstract: "A study involving the survival to flight age of liberated ducklings of six species and their subsequent return as breeders was begun in 1952. Survival of three strains of mallards was reported in a previous paper as about 61 per cent, while for the pintails, redheads, canvasbacks, blue-winged teal, and shovellers reported here the average survival appeared to be about 44 per cent. However, the first-year band returns were greater for the latter species than for the mallards. Also, observations during the spring of 1953 indicated a greater degree of return to the site of release for them than for the mallards. This was especially true considering the numbers calculated to have been available to return. There was some evidence of a greater return of females than males to release sites."

Fredine, C. Gordon. (US F&WS.) MEASURING LIVING SPACE FOR WATERFOWL. Trans. 19th N. Amer. Wildl. Conf. p. 186-192. 1954.

Discussion of the wetlands inventory being made by the Fish & Wildlife Service. This inventory, which is to be completed in 1954, will cover 90% of U. S. wetlands of particular significance to waterfowl. It is producing large scale maps, tabular data, and narrative reports. Results should be of great aid in formulating management goals, determining how much habitat of certain types we have, and ascertaining how much habitat is being lost.

Gaylord, Robert M. (Ducks Unlimited, Rockford, Ill.) MAN IS THE LIMITING FACTOR. Trans. 19th N. Amer. Wildl. Conf. p. 105-109. 1954.

Tells of the waterfowl habitat restoration work of Ducks Unlimited in Canada and points out the need for similar work on public and private lands in U. S. Private efforts are necessary, for governments cannot do the whole job.

BIRDS--WATERFOWL--Continued

Grieb, Jack R., and Erwin L. Boeker. (Colo. Game Dept.) WATERFOWL MIGRATION STUDIES AND THEIR APPLICATION TO MANAGEMENT IN COLORADO. Trans. 19th N. Amer. Wildl. Conf. p. 195-210, map and graphs. 1954.

Report on 6 years of study of numbers and species of waterfowl present in different parts of state during progression of fall and winter. Results are tabulated and graphed. It is shown that certain species or groups can be protected by timing of hunting season. For example, blue-winged teal mostly leave state before season, which is set with large mallard take in mind. On average, flights into state begin in Sept., flights increase strongly in late Oct., population peaks occur in Dec., and there is gradual decline until late Feb. or early March. Other factors involved in setting season are time of freeze-up, hunting pressure, and crop depredation.

Griscom, Ludlow. (MCZ, Harvard U.) PHILOSOPHY OF WATERFOWL ABUNDANCE. Trans. 19th N. Amer. Wildl. Conf. p. 110-113. 1954.

"...the game supply and its scientific management will always be subordinate to human affairs, laws and economic stresses and if one changes radically, so must the other." In America, where game is public property and economic and land-use changes have been rapid, waterfowl and other game have declined rapidly. In Britain, where game is property of the landowner and economic and land-use changes have been different, all waterfowl except Bewick's swan have spread and increased although there are no bag limits and game can be sold. "There is no way out; we must be rationed; the shooting privilege must be reduced, and we must somehow approximate the English common law system."

Hankla, Donald. AQUATIC VEGETATION OF CRAB ORCHARD LAKE AND ITS UTILIZATION AS FOOD BY WATERFOWL. M.A. thesis, Southern Illinois University. 59 p. June 1952.--W. D. Klimstra.

Herman, Carlton M., and Everett E. Wehr. (Patuxent Refuge, Laurel, Md.) THE OCCURRENCE OF GIZZARD WORMS IN CANADA GEESE. Journal of Wildlife Management 18 (4): 509-513. Oct. 1954.

Amidostomum anseris, a nematode, is a widely distributed parasite of Canada geese and has been reported from snow geese. Damage to gizzard is usually severe when 150 or more worms are present. "Gizzard worm infection is considered a contributing factor to low weights, poor condition and to losses among the Canada geese which winter at the Pea Island National Wildlife Refuge in North Carolina. The mean number of gizzard worms per bird is considerably higher for Pea Island than for areas where winter losses have not been reported."

Hochbaum, H. Albert, S. T. Dillon, and J. L. Howard. (Delta Waterfowl Res. Sta., Manitoba.) AN EXPERIMENT IN THE CONTROL OF WATERFOWL DEPREDATIONS. Trans. 19th N. Amer. Wildl. Conf. p. 176-181. 1954.

Reports encouraging progress in controlling depredations near Delta, Man., where mallards may travel 60 miles to feed in cultivated fields and where farmers may lose as much as 20% of their grain to ducks. Conclusions: "The observations of the first two years of this study indicate that...: 1) patrol of threatened areas by a trained man helped to reduce losses of unharvested grain in outlying fields; 2) a combination of gunfire and scaring devices was effective, but that gunfire must persist for several evenings in wet fields and be repeated when the harvest is long delayed; 3) ducks need not be killed for scaring to be effective."

Holm, Earl R., and M. L. Scott. (N. Y. Cons. Dept.) STUDIES ON THE NUTRITION OF WILD WATERFOWL. New York Fish and Game Journal 1 (2): 171-187. July 1954.

Authors' abstract: "Studies were undertaken to determine whether there is a difference in the total protein requirement and animal protein requirement of surface feeding ducks and diving ducks, as well as to ascertain whether or not the nutritional requirements of wild ducks fall into the same class as those of domestic ducks. Diets are described which produced satisfactory growth, egg production, and hatchability in wild ducks under game farm conditions. These

BIRDS—WATERFOWL—Continued

diets are similar to those which promote excellent results in domestic ducks. The protein requirement of young wild ducklings of several different species was found to be no greater than 19 per cent. An 8 per cent level of animal protein produced satisfactory results. A breeder diet containing 18.6 per cent protein gave satisfactory egg production and hatchability. Unsatisfactory results were obtained when a diet containing 17 per cent protein was fed with scratch grains on a free-choice basis. In attempting to reduce feed costs a diet was studied which consisted of mixed whole grains supplemented with protein, vitamin, and mineral concentrates using molasses as a binder. This diet gave satisfactory results."

MacNamara, L. G., chairman, Committee of Atlantic Waterfowl Council. SHOULD THERE BE A NORTHEASTERN FLYWAY? New Jersey Outdoors 5 (3): 9-11, map. Sept. 1954.

Excerpts from report of committee appointed to evaluate proposals of J. A. Hagar (see WR 76: 72). The committee affirms the importance of nesting refuges and habitat restoration. The black duck can stand additional hunting pressure; this should be obtained through a longer season in the Northeast. Regulations for the Northeast should not depend on status of prairie ducks. The Atlantic Flyway need not be divided to obtain a more prolonged harvest of any species. Any change in harvest "should be on an Atlantic Flyway basis rather than on the premise of the creation of a new flyway segment." Opening dates should remain approximately as they now are to prevent excessive kill of waterfowl other than black duck. Intensified banding should be done to clarify present problems.

Mair, W. Winston. (Canadian Wildl. Service, Ottawa.) DUCKS NEED MORE THAN BREEDING GROUNDS. Trans. 19th N. Amer. Wildl. Conf. p. 82-85. 1954.

Needs of waterfowl conflict with those of many other interests. We must "face up to the fact of competition between waterfowl and man, and be prepared to compromise our interest accordingly. For ultimate solution of the conflict the compromise must be a real one; i.e., it must embody modification of objectives and procedures by all interests." Public understanding of waterfowl values, needs, and research findings is vital. Far stronger and better public relations are necessary. Perhaps "undue prominence has been given to the technical aspects of waterfowl (wildlife) conservation. Consideration of the fundamental values, and their forceful presentation through word and deed to the public generally, are more likely to result in properly integrated resource use."

McGill, Bob. (Tribune Newspaper, Meadville, Pa.) WHISTLING WINGS FOR TOMORROW. Pennsylvania Game News 25 (9): 4-9, illus. Sept. 1954.

Account of Pa. waterfowl rearing program. Thousands of mallards are reared artificially. Shortly before they reach flight stage they are released on suitable waters in many parts of state. Some have been known to return to the state in subsequent years and it is expected that many others will do so and eventually build up the state's huntable duck population. A start has been made on a similar program with Canada geese.

Murdy, Ray. (S. D. Dept. Game.) WINTER BANDING STUDIES OF MALLARDS AND CANADA GEESE. South Dakota Conservation Digest 21 (10): 2-5, illus. Oct. 1954.

Analysis of recovery records of birds banded in Black Hills and at Lake Andes, S. D. Two maps show distribution of mallard recoveries.

O'Neill, Edward J. (US F&WS, Brawley, Calif.) ROSS GOOSE OBSERVATIONS. Condor 56 (5): 311. Sept.-Oct. 1954.

A number of records for Imperial Co., Calif. and adjacent areas suggest an extension of wintering range rather than accidental occurrences.

BIRDS—WATERFOWL—Continued

Pirnie, Miles D. (Mich. St. Coll.) THE GRAZING OF DORMANT WINTER WHEAT BY WILD GEESE. Michigan State College, Quarterly Bulletin 37 (1): 95-104, illus. Aug. 1954.

Quantitative study of plots in southwestern Mich. that were grazed by wild or captive geese. Geese clip and graze but seldom pull up the plants. "The experiments did not reveal any reduction in wheat yields attributable to goose grazing on dormant plants." Other local factors such as soil, drainage, and frost heaving do affect yields; some farmers might confuse their effects with that of geese. Most farmers understand the situation. "Many wheat fields in southwestern Michigan are on sloping or rolling land where grazing by geese or by cattle may increase soil erosion hazards. Tent-like scare devices may at times keep wild geese off such fields. The present study did not deal with the effect goose grazing may have on newly-sprouted grain. Such a study should be made."

Smith, Eldon H. (S. D. Dept. Game.) GEOLOGY, GEOGRAPHY AND FLYWAY MANAGEMENT SPELLS DUCKS IN SOUTH DAKOTA. South Dakota Conservation Digest 21 (9): 2-7, illus. Sept. 1954.

Discusses and presents tabular data on spring breeding population in S. D., species composition of this population, and correlations between waterfowl numbers and physiographic regions. Breeding population of S. D. ducks in 1954 was estimated at 811,000, an average of 10.85 ducks per square mile, slightly fewer than in 1953. Most of these ducks are found in relatively small areas in the eastern part of the state.

Smith, Parker B. (Tenn. Game Comm.) REFUGES AID GOOD HUNTING. Tennessee Conservationist 20 (10): 20-23, illus. Oct. 1954.

Gives numerous examples of waterfowl refuges improving hunting in their vicinities. The effect is so marked that hunters who opposed certain refuges are now strongly for them. Many small refuges are needed, and they will have to be set up by states, for the U. S. Fish & Wildlife Service has to concentrate on fewer, larger refuges. One real need is to counteract the goose-concentrating effect of Horseshoe Lake in Ill. States nearby must create similar attractions, and a series of small "stepping stone refuges" along the lower Miss. would help re-establish old patterns of flight to the Gulf Coast and intermediate areas.

Steel, Paul E. FACTORS AFFECTING WATERFOWL PRODUCTION AT GRAY'S LAKE, IDAHO. M.S. thesis, University of Idaho. 114 p. 1952.

Continuation of work of Bizeau (see WR 63: 16). The 2 projects made up a continuous study from 1949-1952.

Stirrett, Geo. M. (Can. Wildl. Serv., Kingston, Ont.) FIELD OBSERVATIONS OF GEESE IN JAMES BAY, WITH SPECIAL REFERENCE TO THE BLUE GOOSE. Trans. 19th N. Amer. Wildl. Conf. p. 211-220. 1954.

As a result of several years of study, data are presented on many topics concerning blue geese: species composition in area (about 94% blues, some lesser snows, a few Canadas and brant), age ratios (favorable in most recent years), composition of family groups (commonly 2 adults and 3 young), kill by white men (usually 3,000-4,000 geese), kill by Indians who depend on this food source (about 75,000 geese), age ratio in bag (proportional to occurrence in population), sex ratio in bag (nearly 1:1), sizes of guns and shot used (heavier guns and shot recommended to reduce crippling), source of hunters (2/3 of whites from U. S.), weights of 272 blue geese by sex and age groups, parasites (few), hybrids or intermediates between blue and lesser snow geese (32% of sample of 307), description of goose habitats in area, and chief foods. Harvest is thought to be well within tolerable limits. Discussion that follows paper proves that some hunters are convinced recommendation for large shot is wrong, and that crippling is greatly reduced by use of shot sizes 6 or 7½.

BIRDS—WATERFOWL—Continued

Stone, Fred E. A DUCK HUNTER'S METHOD OF IDENTIFYING WATERFOWL. Pennsylvania Game News 25 (10): 7-11, illus. Oct. 1954.
Practice is necessary for identifying moving waterfowl at a distance, but this article should speed up the learning period and give new point to it. It tells just what to look for and presents good black-and-white drawings of birds on the wing. Some of the characters used are size, shape, markings, and habits. All common waterfowl of Pa. are discussed.

Wells, Robert A. (N. Y. Cons. Dept., Albany.) WHAT THE STATES CAN DO FOR WATERFOWL. Trans. 19th N. Amer. Wildl. Conf. p. 86-92. 1954.
They should take an active part in work of the Flyway Council. State projects should contribute to (1) understanding of how waterfowl behave in all parts of the flyway, (2) management for larger populations, (3) enactment of regulations that will permit maximum sustained yield, (4) better public understanding of the waterfowl program. Better knowledge of migration in flyways and subflyways is badly needed; this requires intensified banding, in which states should help. Possibilities of developing habitat are unlimited. In N. Y., creation of potholes and small marshes has given good results, and breeding populations of mallards have been established by stocking. Stocking has been stopped because mallards are now widely distributed throughout state. Pintails and redheads are now being tried.

BIRDS—CRANES, RAILS, SHOREBIRDS

Oney, John. FINAL REPORT CLAPPER RAIL SURVEY AND INVESTIGATION STUDY. Georgia Game and Fish Commission, Final Report Federal Aid Project Georgia W-9-R. 1-50 p., illus. + large folding map. 1954.
Bulletin that reports on 3 years of field work on the Ga. coast, 1947-50. The habitat is discussed in considerable detail. Fall food habits are tabulated and discussed. Reproduction is taken up under the headings Time of Nesting, Mating Habits, Nesting Habitat, Nesting Success, Nesting Discussion, Nesting Populations, and Predators. Other sections are devoted to census techniques (count of successful nests is best), hunting and kill in relation to water level and legal restrictions, migration, and trapping methods that were tried. Nesting began in late April. Apparently both parents helped with nests and young. Preferred nesting cover was Spartina alterniflora of medium height near small creeks. Percentage of nests that were successful varied from 36.7 to 93.3, but it is believed that most pairs renest until they bring off a brood. Length of incubation ranged from 18-22 days, av. 20. For one study area nesting birds per acre varied from 0.9 to 1.9. Raccoon seemed to be the major nest predator. Effects of high water levels on nests are also considered. Good hunting statistics were obtained for seasons when use of motor boats was and was not permitted. It is strongly recommended that use of motors be permitted, for without them relatively few hunters can participate, harvest is far lower than it should be, and fewer cripples are recovered. Further research is needed for adjustment of hunting season and bag limits and for habitat management.

Pospichal, Leo B., and William H. Marshall. (U. Minn.) A FIELD STUDY OF SORA RAIL AND VIRGINIA RAIL IN CENTRAL MINNESOTA. Flicker 26 (1): 2-32, illus. March [Oct.] 1954.
Detailed study based on master's thesis. Among topics on which data are given are: trapping and marking techniques, external sex characters of sora, sex and age ratios, arrival dates, prenesting period, nests, laying, clutch size, incubation, hatching, nest and egg success, renesting, nesting densities, productivity, predation, care and habits of young, travels of broods, plumages, juvenile mortality, stomach contents, internal parasites. Average clutch size of sora increased from 9.5 eggs in 1950 to 10.4 in 1951. That of Virginia rail increased from 6 to 8.2. Incubation period averaged 18.7 days for sora, 17.3 for Virginia rail. Nest success for sora rose from 75% in 1950 to 83.3% in 1951, while it remained 50% for Virginia rail. Sora egg success was 71.1% in 1950 and 84.6% in 1951; that of Virginia Was 66.6% and 46.2%. Mammalian

BIRDS--CRANES, RAILS, SHOREBIRDS--Continued

predators seemed to be most important single cause of losses. Renesting was successful for both species. Nesting densities ranged from 0-3.5 pairs of Soras, and 0-1.5 pairs of Virginias per acre. Ratio of soras to Virginias was 3.5 to 1. Some movement between ponds took place. Foods of the 2 species were very similar, but no interspecific competition was noted. Productivity (to hatching) of average pair was 6.8 in 1950 and 9.6 in 1951 for sora, 4 and 4.4 for Virginia rail. Productivity of soras per acre studied was 14.4 in 1950 and 8.9 in 1951. Comparable figures for Virginias were 1.1 and 2.4.

Rapp, William F., Jr. (430 Ivy Ave., Crete, Nebr.) THE STATUS OF CRANES IN NEBRASKA. Wilson Bulletin 66 (3): 218-219. Sept. 1954.

OTHER BIRDS

Allen, Robert P. (Tavernier, Fla.) COMMENTS ON THE STATUS OF THE FLAMINGO IN FLORIDA. Everglades Natural History 2 (3): 115-118, illus. Sept. 1954.
Past and present status. The flamingos in Fla. today are thought to be the result of escapes from large breeding flock at Hialeah race track.

Burckhardt, Dieter. DO PREDATORY BIRDS PLAY A ROLE AS "HEALTH POLICE?" Der Ornithologische Beobachter 50 (5): 149-152. 1953. [From review by R. O. Bender, Bird-Banding 25 (3).]
In German. A review of a paper by G. Rudebeck which appeared in Oikos 2: 65-88, and 3: 200-231. "No clear-cut answer to the title question can be given from these or other available data, but the trend [of the data] suggests that more abnormal (in behavior or in physical structure) birds are taken than are normally present in wild populations. The review concludes with a plea for more study of the subject." Bender's review includes a table showing that, for prey birds of 4 kinds of hawks, percentages of abnormal individuals ranged from 14.3 to 33.3.

Stallcup, William B. MYOLOGY AND SEROLOGY OF THE AVIAN FAMILY FRINGILLIDAE, A TAXONOMIC STUDY. University of Kansas Publications, Museum of Natural History, 8 (2): 157-211, illus. Nov. 1954.
Leg muscles and comparative serology, both considered phylogenetically conservative, were studied. Results are integrated with those of Beecher and Tordoff and a new classification of subfamilies of Fringillidae and closely related groups is proposed.

REPTILES AND AMPHIBIANS

Anderson, Paul K. (Orange, Mass.) STUDIES IN THE ECOLOGY OF THE NARROW-MOUTHED TOAD, MICROHYLA CAROLINENSIS CAROLINENSIS. Tulane Studies in Zoology 2 (2): 15-46, graphs. Nov. 1954.
Environmental factors, habitats, diel activity cycle, movement, food habits, predation, voice, gonadal cycle, reproductive behavior, reproductive potential, growth and development, populations.

Bell, Edwin Lewis, II. A TAXONOMIC AND EVOLUTIONARY STUDY OF THE WESTERN FENCE LIZARD, SCELOPORUS OCCIDENTALIS, AND ITS RELATIONSHIPS TO THE EASTERN FENCE LIZARD, SCELOPORUS UNDULATUS. Ph.D. thesis, University of Illinois. 170 p. 1954. [From abstract in Dissertation Abstracts 14 (10).]
The 2 species are considered distinct. Revision of races of S. occidentalis is presented.

Bragg, Arthur N. (U. Okla.) AGGREGATIONAL BEHAVIOR AND FEEDING REACTIONS IN TADPOLES OF THE SAVANNAH SPADEFOOT. Herpetologica 10 (2): 97-102. Aug. 1954.

REPTILES AND AMPHIBIANS--Continued

Cagle, Fred R. (Tulane U.) OBSERVATIONS ON THE LIFE HISTORY OF THE SALAMANDER NECTURUS LOUISIANENSIS. Copeia 1954 (4): 257-260. Oct. 1954.
Methods of capture, diel activity cycle, habitats, sizes, probable breeding season, foods.

Cagle, Fred R. (Tulane U.) TWO NEW SPECIES OF THE GENUS GRAPTEMYS. Tulane Studies in Zoology 1 (11): 167-186, illus. Aug. 1954.
Discovery of a new species of reptile in the U. S. is now a surprise. This paper describes 2: G. flavimaculata from the Pascagoula River and its tributaries in Miss., and G. nigrinoda from Black Warrior and Alabama Rivers, Ala. Both are distinct from though allied to G. oculifera of the Pearl River system in La. and Miss. The paper compares these 3 species in detail, presents a key to forms of the genus, discusses habitats and relationships, and includes range map, color plate, photographs, and drawings.

Carr, A. F., Jr. (U. Fla.) THE PASSING OF THE FLEET. A.I.B.S. Bulletin 4 (5): 17-19. Oct. 1954.
History and present status of exploitation of green turtle in Caribbean. This valuable commercial species has been reduced to an endangered remnant. Its food supply is intact, however, and if we could get protection of some of the valuable beaches that are used for egg laying, it should be possible to restore the species to its former position as an important resource. The paper gives considerable information on biology and homing of the green turtle.

Cliff, Frank S. (Stanford U.) SNAKES OF THE ISLANDS IN THE GULF OF CALIFORNIA, MEXICO. Transactions of the San Diego Society of Natural History 12 (5): 67-98, illus. Oct. 1954.
Based on study of new and old collections. All known species and subspecies are discussed critically. One new name is proposed in Chilomeniscus, 2 new ones in Crotalus.

Cochran, Doris M. (U. S. Nat. Mus.) OUR SNAKE FRIENDS AND FOES. National Geographic Magazine 106 (3): 334-364, illus. Sept. 1954.
This popular article on U. S. snakes is illustrated not only with black and white photographs but with full color paintings by Walter A. Weber that are among the finest paintings of snakes that the reviewer has seen. The article and its illustrations should be of real value in educational work.

Edgren, Richard A. (G. D. Searle & Co., Chicago.) FACTORS CONTROLLING COLOR CHANGE IN THE TREE FROG, HYLA VERSICOLOR WIED. Proceedings of the Society for Experimental Biology and Medicine 87 (1): 20-23, graphs. Oct. 1954.
Experiments demonstrate that light and cold result in darkening, presumably through release of melanophorotropic hormone from pituitary. "Light-induced changes, opposite to those shown by other frogs, seem explicable on the basis of natural selection during the diurnal period when these frogs are inactive."

Fitch, Henry S. (U. Kans.) LIFE HISTORY AND ECOLOGY OF THE FIVE-LINED SKINK, EUMECES FASCIATUS. University of Kansas Publications, Museum of Natural History 8 (1): 1-156, illus. Sept. 1954.
One of the longest and most thorough accounts of the field biology of any reptile. Summary alone occupies 6 pages. The paper is based chiefly on 4 years of field and laboratory work at the University of Kansas Natural History Reservation, but results are integrated with those of other workers. Among the many topics are: distribution, relationships, habitats, body temperatures, behavior at various temperatures, hibernation, color changes, mating, fighting, eggs, growth of young, regeneration of tail, home ranges, foods, enemies, escape behavior, abundance, and parasites.

Hellman, Robert E. (U. Fla.) A COMPARATIVE STUDY OF THE EGGS AND TADPOLES OF HYLA PHAEOCRYPTA AND HYLA VERSICOLOR IN FLORIDA. Publications of the Research Division, Ross Allen's Reptile Institute, 1 (6): 61-74, illus. Feb. 1953.

REPTILES AND AMPHIBIANS--Continued

Hendrickson, John R. ECOLOGY AND SYSTEMATICS OF SALAMANDERS OF THE GENUS BATRACHOSEPS. University of California Publications in Zoology 54 (1): 1-46, illus. July 1954. 75¢.
The ecological section is based on a local study and covers collecting, measuring, marking (toe clipping best), numbers, home range (usual cruising radius of 5½ feet or less), response to climatic factors, color changes, regeneration, storage function of tail, and growth. The systematic section is based on a detailed, statistical study of variation in many samples. The author found so much random, local variation that he synonymized several named forms and recognized only 3: B. wrighti, B. a. attenuatus, and B. a. pacificus. In some places the races of attenuatus occur together and are distinct. In other places there are numerous intermediates. In some large areas only intermediates are found.

Hill, Imogene R. (U. of N. M.) THE TAXONOMIC STATUS OF THE MID-GULF COAST AMPHIUMA. Tulane Studies in Zoology 1 (12): 191-215, map and graphs. Aug. 1954.
Careful systematic study with statistical analysis of geographic and ontogenetic variation. Author concludes that 2 distinct species are present, A. means and A. tridactylum.

Killian, J. L. COMMON REPTILES OF ARIZONA. Arizona Game and Fish Department. 1-15 p., illus. 1954.
Several of the common or more interesting species or groups are well illustrated and described and brief notes are given on habits.

Lowe, Charles H., Jr. (U. Ariz.) ISOLATING MECHANISMS IN SYMPATRIC POPULATIONS OF SOUTHWESTERN ANURANS. Texas Journal of Science 6 (3): 265-270. Sept. 1954.

Lowe, Charles H., Jr., and Kenneth S. Norris. ANALYSIS OF THE HERPETOFAUNA OF BAJA CALIFORNIA, MEXICO. Transactions of the San Diego Society of Natural History 12 (4): 47-64, illus. Sept. 1954.
First of a new series. This issue describes in detail a new race of rattler, Crotalus enyo furvus, and discusses its variation and ecology.

McDowell, Samuel Booker, Jr., and Charles M. Bogert. THE SYSTEMATIC POSITION OF LANTHANOTUS AND THE AFFINITIES OF THE ANGUINOMORPHAN LIZARDS. Bulletin of the American Museum of Natural History 105 (1): 1-142 p., illus + 16 plates. Oct. 1954. $3.00.
Important and copiously illustrated volume on anatomy and classification of several families of lizards that are or have been thought to be in the anguinomorph group. Numerous changes of classification and apparent relationships are proposed. Among other things, it is shown that the Typhlopidae, unlike the Leptotyphlopidae, are not snakes and are not closely related to snakes.

Neill, Wilfred T. (Ross Allen's Reptile Inst., Silver Springs, Fla.) RANGES AND TAXONOMIC ALLOCATIONS OF AMPHIBIANS AND REPTILES IN THE SOUTHEASTERN UNITED STATES. Publications of the Research Division, Ross Allen's Reptile Institute, 1 (7): 75-96. Oct. 1954.
A compact, important paper that calls attention to numerous changes of names and range statements. In a sense, the paper may be considered a supplement to Schmidt's 1953 checklist. One section is devoted to strong arguments for reinstatement of several southeastern races of Elaphe.

Neill, Wilfred T., and E. Ross Allen. (Silver Springs, Fla.) ALGAE ON TURTLES: SOME ADDITIONAL CONSIDERATIONS. Ecology 35 (4): 581-584, illus. Oct. 1954.
Further information on the phenomenon and discussion of causes and consequences.

REPTILES AND AMPHIBIANS--Continued

Schmidt, Karl P. (Chicago Nat. Hist. Mus., Chicago 5.) OMISSIONS FROM THE SIXTH EDITION OF THE CHECK LIST OF NORTH AMERICAN AMPHIBIANS AND REPTILES. Copeia 1954 (4): 304-306. Oct. 1954.

It is pointed out that although the Check List was published in 1953, the deadline for inclusion was Dec. 31, 1951. The Check List therefore cannot be criticized for omission of material published after that date. The present paper provides entries for 4 subspecies, 2 synonyms, and 18 type localities that should have been included in the Check List.

Schöttler, W. H. A. (Inst. Butantan, São Paulo, Brazil.) EXPERIMENTAL STUDY ON THE IMPORTANCE OF EARLY ANTIVENIN TREATMENT IN SNAKE BITE. American Journal of Tropical Medicine and Hygiene. 1 (6): 1038-1042. Nov. 1952.

Special triple-strength antivenins were tested on mice injected with Bothrops jararaca or Crotalus terrificus venom. Applying the results to man, it is believed that intravenous injection of very large doses of specific antivenin would give a high degree of protection from Bothrops bites if used within 2 hours after bite. Impracticably large doses of specific antivenin would be needed for severe Crotalus terrificus bites, but antivenin should be helpful in less severe bites that might otherwise be fatal.

Smith, F. G. Walton. (U. Miami.) TAXONOMY AND DISTRIBUTION OF SEA TURTLES. In Gulf of Mexico / Its Origin, Waters, and Marine Life. U. S. Fish & Wildlife Service, Fishery Bulletin 89. p. 513-515. 1954.

Identification, synonymy, distribution, and abundance of marine turtles of Gulf of Mexico.

Test, Frederick H. (U. Mich.) SOCIAL AGGRESSIVENESS IN AN AMPHIBIAN. Science 120 (3108): 140-141. July 23, 1954.

Wood, John Thornton. (U. Va.) A SURVEY OF 200 CASES OF SNAKE-BITE IN VIRGINIA. American Journal of Tropical Medicine and Hygiene 3 (5): 936-943. Sept. 1954.

FISHES

Hubbs, Clark. (U. Texas.) CORRECTED DISTRIBUTIONAL RECORDS FOR TEXAS FRESH-WATER FISHES. Texas Journal of Science 6 (3): 277-291, illus. Sept. 1954.

INVERTEBRATES

Bohnsack, Kurt Karl. A STUDY OF THE FOREST FLOOR ARTHROPODS OF AN OAK-HICKORY WOODS IN SOUTHERN MICHIGAN. Ph.D. thesis, University of Michigan. 353 p. 1954. [From long abstract in Dissertation Abstracts 14 (7).]

Detailed ecological study.

VEGETATION--GENERAL, ECOLOGY, CONTROL, TECHNIQUES

Crocker, William, and Lela V. Barton. PHYSIOLOGY OF SEEDS / AN INTRODUCTION TO THE EXPERIMENTAL STUDY OF SEED AND GERMINATION PROBLEMS. Chronica Botanica Co., Waltham, Mass. 267 p., illus. 1953. $6.50. [From Journal of Range Management 7 (2).]

VEGETATION--GENERAL, ECOLOGY, CONTROL, TECHNIQUES--Continued

Egler, Frank E. (Amer. Mus. Nat. Hist., N. Y.) FIFTY MILLION MORE ACRES FOR HUNTING. Sports Afield 132 (6): 48-51, illus. Dec. 1954.
Suggestions to sportsmen for putting into effect the author's plan for getting power line right of ways covered with relatively stable brushy growth instead of grass. As in Egler's previous papers on the subject, chief tool recommended is selective basal bark spraying. "Yet even this technique isn't perfect. The larger conifers and other thick-barked trees are either not affected by basal spraying, or else require exorbitant amounts of spray... Hand cutting and mechanical ringing of the bark still seem to have a place, especially on very big trees. Fire has a role in some areas. In some regions, grazing may be the cheapest means of brush control. Machines such as bulldozers also have their role. More often than not, it will be a carefully chosen combination of two or more of these methods that will be cheapest, and also best for wildlife." Graphs show costs per acre of conversion and maintenance under blanket spraying and selective treatment methods. The latter seems far cheaper in the long run.

Egler, Frank E. (Amer. Mus. Nat. Hist., N. Y. 24.) ROADSIDE RAIDERS / THE MEN WHO SPURN ECOLOGY IN THE NAME OF "BRUSH CONTROL." Nature Magazine 47 (8): 398. Oct. 1954.
Roadsides and right-of-ways are being blanketed with herbicides that kill (at least to ground) almost all plants except grass. Some of this spraying is necessary, much is not. Certainly a vast amount of wildlife habitat is lost. Selective basal spraying gives control of young trees or other unwanted species and costs no more than blanket spraying. The resultant brushy cover has scenic and wildlife values, and often it is effective in holding back tree growth. Research tests of basal spraying are being made on 22 research areas in 11 eastern states, and commercial applications are being made extensively.

McKnight, J. S., and G. M. Furnival. KILLING BOTTOMLAND CULLS. U. S. Forest Service, Southern Forest Experiment Station (New Orleans), Southern Forestry Notes no. 93. p. 1-2. Sept. 1954.
"A mixture of 2,4,5-T and water, applied in frills, is a cheap and effective method of deadening cull hardwoods in the Mississippi Delta." Basal bark spraying was unsatisfactory. "Only 41% of the sprayed trees were dead 2 years after spraying." Costs and results of various treatments are stated.

VEGETATION--FLORAS AND COMMUNITIES

Blake, S. F. GUIDE TO POPULAR FLORAS OF THE UNITED STATES AND ALASKA. U. S. Department of Agriculture, Bibliographical Bulletin no. 23. 56 p. 1954. 25¢ from Superintendent of Documents. [Copy of review in A.I.B.S. Bulletin 4 (5).]
"A handy reference booklet for all naturalists, this small volume is an annotated, selected list of nontechnical works for the identification of flowers, ferns and trees. Approximately 30 general publications are listed and all other specific references are grouped by states. Each entry gives title, author, pages, publisher, date and price, as well as a brief description of the material covered in each book."

Breitung, August J. (Can. Dept. Agr., Ottawa.) A BOTANICAL SURVEY OF THE CYPRESS HILLS. Canadian Field-Naturalist 68 (2): 55-92, illus. April-June 1954.
Description of area, factors affecting vegetation, descriptions of plant communities, annotated list of species. Several photographs of habitats. Cypress Hills are in sw. Saskatchewan and se. Alberta.

Fraser, W. P. (deceased), R. C. Russell, G. F. Ledingham, and R. T. Coupland. AN ANNOTATED LIST OF THE PLANTS OF SASKATCHEWAN. University of Saskatchewan, Saskatoon. vi + 50 p., illus. 1953.
List of higher plants. Includes scientific and common names, indications of habitats and regions of occurrence, photographs of habitats, and index.

VEGETATION--FLORAS AND COMMUNITIES--Continued

Woodin, Howard E., and Alton A. Lindsey. (Middlebury Coll., Middlebury, Vt.) JUNIPER-PINYON EAST OF THE CONTINENTAL DIVIDE, AS ANALYZED BY THE LINE-STRIP METHOD. Ecology 35 (4): 473-489, map and graphs. Oct. 1954.
Study of community characteristics of these stands, with considerable attention to development of methods for extensive studies.

VEGETATION--TREES

Baker, Harold L., and Adon Poli. AREA AND OWNERSHIP OF FOREST LAND IN SAN MATEO COUNTY, CALIFORNIA. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley), Forest Survey Release no. 22. iii + 22 p., maps and graphs. May 1954.

Central States Forest Survey. FOREST STATISTICS FOR THE GLACIATED REGION OF OHIO. U. S. Forest Service, Central States Forest Experiment Station (Columbus, Ohio), Forest Survey Release no. 16. iii + 33 p., map and graphs. Sept. 1954.
Areas, ownership, timber volumes (by species).

Central States Forest Survey. FOREST STATISTICS FOR THE HILL COUNTRY OF OHIO. U. S. Forest Service, Central States Forest Experiment Station (Columbus, Ohio), Forest Survey Release no. 17. iii + 44 p., map and graphs. Sept. 1954.

Fry, Wilbert M. THE CHINESE CHESTNUT. West Virginia Conservation 18 (7): 10-11, illus. Sept. 1954.
Planting, care, and uses.

Heinselman, M. L. (U. S. Forest Service, Grand Rapids, Minn.) THE EXTENT OF NATURAL CONVERSION TO OTHER SPECIES IN THE LAKE STATES ASPEN-BIRCH TYPE. Journal of Forestry 52 (10): 737-738. Oct. 1954.
"The results of this study show conclusively that the shade-tolerant northern hardwoods and balsam fir are the most successful invaders of the aspen-birch type. The pines and oaks are only occasionally able to take over aspen areas." Figures are given and implications for forestry are outlined.

McCormack, J. F., and James W. Cruikshank. FOREST STATISTICS FOR GEORGIA, 1951-53. U. S. Forest Service, Southeastern Forest Experiment Station (Asheville, N. C.), Forest Survey Release no. 44. iv + 77 p., map and graphs. Nov. 1954.
Comparisons are made with results of 1936 survey. Two out of every 3 acres are in forest. Commercial forest land increased by 2.6 million acres. Now 34% of forested area is in hardwood types as compared with 22% in 1936. One-fourth of forest land is poorly stocked. Sawtimber volume is down 13%, but there are many millions more small trees than there were. Amount of wood in cull trees has doubled in the last 18 years.

Minn. THE FOREST RESOURCE OF BECKER COUNTY. Office of Iron Range Resources and Rehabilitation, 624 State Office Building, St. Paul 1, Minn. 1-61 p., illus. 1954.
Detailed forest survey.

Minn. THE FOREST RESOURCE OF THE RED RIVER VALLEY. Office of Iron Range Resources and Rehabilitation, 624 State Office Building, St. Paul 1, Minn. 1-57 p., illus. 1954.
Detailed forest survey that covers northwestern counties of Minn.

VEGETATION--TREES--Continued

Netboy, Anthony. THE INDIAN AND THE FOREST. American Forests 60 (10): 24-25, 63. Oct. 1954.
Useful in bringing together information on Indian populations in different regions of U. S. and on why and how Indians cleared forest land. Much more land was opened by Indians than is generally thought. Indians moved from one site to another, clearing and abandoning as circumstances required. Some of their clearings were huge, and in the aggregate they covered a tremendous acreage. It is estimated that there were 30-40 acres of cleared land per Indian in Virginia at time of settlement. The total area and effect of Indian clearing probably was even greater than one would gather from this article. See, for example, paper by G. M. Day in April 1953 issue of Ecology.

Northeast Forest Survey. FOREST STATISTICS FOR NEW YORK FOREST DISTRICT NO. 2, 4, 5, 6, 8, 9, and 10. U. S. Forest Service, Northeastern Forest Experiment Station (Upper Darby, Pa.), Forest Statistics Series: New York nos. 4, 5, 6, 7, 8, 9, and 10. Seven separate reports. Each has ii + 19 p. 1954.
Reports on forest areas and timber volumes in blocks of counties in south-central, central, northern, and western N. Y.

Poli, Adon, and Harold L. Baker. OWNERSHIP AND USE OF FOREST LAND IN THE REDWOOD--DOUGLAS-FIR SUBREGION OF CALIFORNIA. U. S. Forest Service, California Forest and Range Experiment Station (Berkeley), Technical Paper no. 7. iii + 76 p., illus. June 1954.

Reed, Clarence A., and John Davidson. THE IMPROVED NUT TREES OF NORTH AMERICA AND HOW TO GROW THEM. Devin-Adair Co. (23 E. 26th St., N. Y. 10, N. Y.). 425 p., illus. 1954. $6.00.
The authors, both experts, have written a book that (to quote the publisher), "provides the most up-to-date information on cultivating nut trees for all sections of the United States. Here is everything that the nut-tree grower should know about planting, grafting, pruning, fertilizing, blight and pest prevention, curing and marketing." Sections of the book cover walnuts, hickories, chestnuts, beeches, oaks, filberts, buckeyes, nut trees for specific climates, propagation and culture, developing fine nuts, pests and diseases, food values and chemical composition of nuts.

Stoke, H. F. PROPAGATION OF NUT TREES FOR MAN AND WILDLIFE. Virginia Wildlife 15 (9): 21-23, illus. Sept. 1954.
Suggestions for selecting and growing good varieties of chestnuts, walnuts, hickories, and hazels.

Whitford, Philip B., and Peter J. Salamun. (U. Wis. Extension Div., Milwaukee.) AN UPLAND FOREST SURVEY OF THE MILWAUKEE AREA. Ecology 35 (4): 533-540, maps. Oct. 1954.
Discussion of past and analysis of present vegetation. "A survey of 22 upland forest stands was made using the 'random pairs' method of sampling. The data were analyzed in terms of the continuum concept."

VEGETATION--PASTURE AND RANGE

Blaisdell, James P. (U. S. Forest Service, Ogden, Utah.) ECOLOGICAL EFFECTS OF PLANNED BURNING OF SAGEBRUSH-GRASS RANGE ON THE UPPER SNAKE RIVER PLAINS. U. S. Department of Agriculture, Technical Bulletin no. 1075. 1-39 p., illus. July 1953. 15¢ from Superintendent of Documents.
Thorough study of changes in vegetation and soil on 2 large burns over 15- and 12-year periods. Burns greatly improve some sheep ranges, but should not be used on others. Burns do not result in permanently sage-free stands, but they do produce stands that may remain open for a number of years.

VEGETATION--PASTURE AND RANGE--Continued

Huss, Donald L. FACTORS INFLUENCING PLANT SUCCESSION FOLLOWING FIRE IN ASHE JUNIPER WOODLAND TYPES IN REAL COUNTY, TEXAS. M.S. thesis, Texas A & M College. May 1954. [From long abstract in Journal of Range Management 7 (5).]
Most influential factors were "the original vegetation type, fire tolerance of species, fire-induced germination, seed dissemination, grazing, shade tolerance of species, precipitation and exposure. Grazing intensities were found to be the most important of all successional factors... It was concluded that fire with proper management thereafter is an effective tool in the eradication and control of Ashe juniper."

Pino, Ricardo. COMPARATIVE EFFICIENCY OF VARIOUS LENGTHS OF BELT TRANSECTS IN ESTIMATING FORAGE PRODUCTION ON SEMIDESERT GRASSLAND RANGE. M.S. thesis, New Mexico A & M College. 1954. [From abstract in Journal of Range Management 7 (5).]

Sharp, Lee A. (U. of Idaho.) EVALUATION OF THE LOOP PROCEDURE OF THE 3-STEP METHOD IN THE SALT-DESERT SHRUB TYPE OF SOUTHERN IDAHO. Journal of Range Management 7 (2): 83-88, illus. March 1954.
Report on tests of a rapid method of determining range condition and changes in it. "The loop method appears to be reasonably well adapted for obtaining quantitative records of vegetational and other site factors on range areas of the types studied... The method is rapid and advantageous for the determination of germination sequences, effects of herbicidal treatments and other quantitative studies."

Sturm, John L. A STORY OF A RELIC AREA IN NORTHERN MONTANA. M.S. thesis, University of Wyoming. June 1954. [From abstract in Journal of Range Management 7 (5).]
"A study was made of a grassland relic of the short grass plains... Climatic and soil conditions under which the native vegetation developed were described. A comparison was made between plant species composition on the relic and on grazed range."

Weaver, J. E. (U. Nebr.) A SEVENTEEN-YEAR STUDY OF PLANT SUCCESSION IN PRAIRIE. American Journal of Botany 41 (1): 31-38, illus. Jan. 1954.
Big and little bluestem prairie near Lincoln, Nebr.--Neil Hotchkiss.

Weaver, J. E. NORTH AMERICAN PRAIRIE. Johnsen Publishing Co., Lincoln 8, Nebr. 348 p., illus. 1954. $5.00. [From review in A.I.B.S. Bulletin 4 (5).]
"Dr. Weaver...spent his life studying this particular biotype and has authored or coauthored some 80 articles, 4 monographs and 11 books. The nature of grassland and its constituent species of grass, lowland and upland communities and their principal forms, roots and rhizomes, the seasonal aspects of the prairie and its stability are discussed. Plant-soil relationships, the effects of settlement and drought, and the processes of degeneration and regeneration form the subjects of other chapters."

Whitman, Warren C., and Einar I. Siggeirsson. (N. D. Agr. Exp. Sta., Fargo.) COMPARISON OF LINE INTERCEPTION AND POINT CONTACT METHODS IN THE ANALYSIS OF MIXED GRASS RANGE VEGETATION. Ecology 35 (4): 431-436. Oct. 1954.

Wieslander, A. E., and Clark H. Gleason. MAJOR BRUSHLAND AREAS OF THE COAST RANGES AND SIERRA-CASCADE FOOTHILLS IN CALIFORNIA. U. S. Forest Service, California Forest & Range Experiment Station (Berkeley), Miscellaneous Paper no. 15. 1-9 p., illus. June 1954.
Types, acreages, locations. Map and 7 photographs.

VEGETATION--WET-LAND

Cottam, Clarence, and David A. Munro. (Brigham Young U., Provo, Utah.) EELGRASS STATUS AND ENVIRONMENTAL RELATIONS. Journal of Wildlife Management 18 (4): 449-460. Oct. 1954.

History and importance of Zostera marina; present status in N. Amer. and Europe as determined from more than 360 reports; new information on environmental tolerance of the plant; failure of attempts at transplanting; theories as to cause of decline. "On the eastern coast...eelgrass is still considerably less abundant than prior to 1930. However, there has been marked improvement in many areas, particularly in the past few years. Its present status varies locally from absent or scarce to abundant. In a few places such as Chesapeake Bay, conditions approximate those prevailing before the 1930 decline. On the Pacific coast, eelgrass status has remained fairly stable."

Martin, Alexander C. (Patuxent Refuge, Laurel, Md.) A CLUE TO THE EELGRASS MYSTERY. Trans. 19th N. Amer. Wildl. Conf. p. 441-446, graphs. 1954.

Graphs and figures are given to show that eelgrass declines usually were associated with times of severe drought, and that 1 or 2 declines came at times of excessive precipitation. This is, of course, not proof that weather is a major factor in eelgrass declines. "It seems particularly significant, however, that the three worst declines in the areas concerned accompanied the three worst droughts (1894, 1921, and 1930). Whereas it seems probable that such declines have resulted from associated conditions favorable to the eelgrass parasite, it appears equally logical to assume that a decline such as the 1889 one in Chesapeake Bay, following the Johnstown flood, may reflect direct detrimental effects from factors such as excessive freshness, excessive turbidity, or submergence under silt. Future studies under controlled conditions may give conclusive verdicts on these points and on the role (if any) of precipitation extremes as a factor in eelgrass declines."

GENERAL CONSERVATION, WATER, AND CLIMATE

Allen, Shirley W. (U. Mich.) BROAD OBJECTIVES OF OWNERSHIP AND USE OF LAND. Trans. 19th N. Amer. Wildl. Conf. p. 8-12. 1954.

"Our first broad objective, therefore, seems to me to be this: In view of the established ownership pattern, to make this pattern work for the greatest benefit of mankind by understanding what is the greatest good, by insisting upon the production of this good by the owner, as the price of ownership, and by gearing our own use to this understanding and this insistence... But which of our conservation activities are beamed toward realizing it?"

Battles, Roy. (Natl. Grange, Wash., D. C.) THE PRODUCER'S VIEWPOINT CONCERNING OWNERSHIP AND USE OF NATURAL RESOURCES. Trans. 19th N. Amer. Wildl. Conf. p. 29-34. 1954.

Makes a strong case for importance of private enterprise in farming and other resource use, but grants need of some regulation and much education of those utilizing resources. Author feels that parks, game preserves, and public recreational areas are generally public responsibilities, but that many large forest tracts should be placed in private hands with certain stipulations as to type of management.

Bender, J. H. (Pa. Fed. Sportsmen's Clubs, Williamsport.) THE PLACE OF STREAM POLLUTION CONTROL IN WATERSHED MANAGEMENT. Trans. 19th N. Amer. Wildl. Conf. p. 73-79. 1954.

Tells of the urgent importance of controlling pollution and discusses ways in which control can be attained.

Blosser, R. H. ECONOMICS OF SOIL CONSERVING PRACTICES ON MUSKINGUM AND ASSOCIATED SOILS IN OHIO. Ohio Agricultural Experiment Station (Wooster), Research Bulletin 746. 1-31 p., illus. Aug. 1954.

Detailed study of economics of various practices.

GENERAL CONSERVATION, WATER, AND CLIMATE—Continued

Gabrielson, Ira N. (Wildl. Mgt. Inst., Wash., D. C.) FORMAL OPENING. [PRESENT STATUS OF CONSERVATION IN FEDERAL GOVERNMENT.] Trans. 19th N. Amer. Wildl. Conf. p. 1-5. 1954.
Attack on conservation policies and attitudes of administration and congressional committees.

Nelson, DeWitt. (Calif. Dept. Nat. Resources, Sacramento.) OWNERSHIP AND USE OF NATURAL RESOURCES: THE STATE'S POINT OF VIEW. Trans. 19th N. Amer. Wildl. Conf. p. 20-24. 1954.
The once-marginal public lands that occupy 54% of all land in 11 western states have become of high economic importance. Their importance is multiple, and partly because of this it is difficult to devise good ways of putting these lands into private ownership. Counties and states with much public land encounter financial problems because of them; some sort of payments in lieu of taxes should be made by state or federal owners. The many users of public lands should be placed on a pay-as-you-go basis. There are a few areas where existing ownership patterns should be adjusted. We need much more knowledge of how to get maximum production from all our resources.

Peterson, George L. (Minneapolis Star, Minneapolis, Minn.) OWNERSHIP AND USE OF NATURAL RESOURCES: THE NATIONAL VIEWPOINT. Trans. 19th N. Amer. Wildl. Conf. p. 12-19. 1954.
While granting the importance and values of control of land and conservation programs by individual states, the author points out the importance of federal activities in these fields. He feels that the federal government has taken the lead in and set standards for functions that were much needed, and that it is less vulnerable to pressure from small selfish minorities.

Van Heuvelen, W. (N. D. Dept. Health.) SEWAGE DISPOSAL BY THE LAGOON METHOD. Outdoor News Bulletin 8 (21): 4-5. Oct. 15, 1954.
Tells of a cheap sewage disposal method that helps wildlife. Ten- to 40-acre lagoons 3-5 feet deep receive raw sewage and render it harmless and unobjectionable through action of wind, algae, and the oxygen they introduce. The system is suitable for towns of up to at least 20,000 persons. "A sewage lagoon, in all its appearances, looks like a pothole area. The observer can walk around the dikes and note no nuisance conditions, and certainly would not recognize this area as being fed by raw sewage." "Water fowl and shore birds find abundant food supplies in and around the lagoon. One observer had noted that a sewage lagoon becomes a very fine wildlife habitat... Because of the rich food supply that is found in and about the lagoons, birds will be attracted to a sewage lagoon and choose this in preference to a natural pothole..." A more technical account appears in the June 1954 issue of "Sewage and Industrial Wastes."

Williams, D. A. (U. S. Soil Cons. Service.) WHAT IS WATERSHED CONSERVATION? Trans. 19th N. Amer. Wildl. Conf. p. 40-48. 1954.
Describes aims and approaches of the small watershed management program.

Wilm, H. G. (N. Y. St. Coll. Forestry.) THE PLACE OF FOREST AND RANGE IN WATERSHED CONSERVATION. Trans. 19th N. Amer. Wildl. Conf. p. 50-56. 1954.
"The purpose of this paper is to express, from the viewpoint of my own experience, the real place of forest and range management in watershed conservation, as contrasted to farm-land management, land drainage, and upstream engineering structures. My thesis will be that forest and range management has an important influence on watershed conditions which should not be underemphasized; that cropland management exerts its principal effects on soil stability rather than stream-flow regulation; and that the effects of upstream engineering works, including land drainage, are ordinarily local in nature and not always beneficial."

GENERAL CONSERVATION, WATER, AND CLIMATE--Continued

Yale Conservation Club. YALE CONSERVATION STUDIES, vol. 3, no. 1. iii + 28 p. 1954. (Available from Yale Conservation Program, 77 Prospect St., New Haven, Conn.)

Nine essays by Yale students of conservation. The calendar won't wait (need of planning for proper land use), by W. H. Appel. The American lobster fishery and possible applications of artificial propagation, by F. T. Carlson. Comments on urban migration into rural areas, by Jane Collier. The citizen's role in pollution abatement, by Mary A. Heimerdinger. Forest utilization and ownership problems in Japan, by Tohru Ishimitsu. Game management and the sportsman's attitude (undesirability of stocking pheasants for the gun and neglecting grouse in Conn.), by George Lamb. Climate and erosion in the Southwest, by Estella B. Leopold. Why destroy the national parks? by Dorothy Rainsford. Water pollution control in Ohio, by C. F. Schnee.

SOILS

Buckhannan, W. H. SOIL SURVEY OF CLEVELAND COUNTY, OKLAHOMA. U. S. Soil Conservation Service, Series 1942, no. 7. 1-68 p., illus. + large folding maps. Oct. 1954. Price not stated. Order from Superintendent of Documents.

Cole, Ralph C., and others. SOIL SURVEY OF THE SACRAMENTO AREA, CALIFORNIA. U. S. Soil Conservation Service, Series 1941, no. 11. 1-101 p., illus. + large folding maps. Aug. 1954. Price not stated. Order from Superintendent of Documents.

Goldston, E. F., and others. SOIL SURVEY OF BUNCOMBE COUNTY, NORTH CAROLINA. U. S. Soil Conservation Service, Series 1942, no. 6. 1-122 p., illus. + large folding maps. Aug. 1954. Price not stated. Order from Superintendent of Documents.

Layton, M. H. SOIL SURVEY OF BLAINE COUNTY, NEBRASKA. U. S. Soil Conservation Service, Series 1941, no. 13. 1-60 p., illus. + large folding maps. Oct. 1954. Price not stated. Order from Superintendent of Documents.

Poulson, E. N., and others. SOIL SURVEY OF THE SULPHUR SPRING VALLEY AREA, ARIZONA. U. S. Soil Conservation Service, Series 1940, no. 14. 1-79 p., illus. + large folding maps. Nov. 1954. $1.75 from Superintendent of Documents.

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